

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1926	
Jan. 7	Prof. A. J. Sutton Pippard. "The Experimental Stress Analysis of Frameworks," before R.Ae.S.
Jan. 12	Mr. C. Howarth. "Some Aspects of Full-Scale Experiments," before Inst.Ae.E.
Jan. 13	London Aeroplane Club Inaugural Dance, Suffolk Galleries, Suffolk Street, W. 1.
Jan. 21	Maj. J. S. Buchanan. "The Schneider Cup Race, 1925," before R.Ae.S.
Jan. 26	Lieut. Olechnovitch. "The Care and Maintenance of Tools as an Important Factor in Workshop Routine," before Inst.Ae.E.
Feb. 4	Joint Meeting of R.Ae.S. and Inst.Ae.E. at R. Soc. of Arts. Mr. L. C. Lawrence, "American Aircraft Engine Development."
Feb. 9	Informal Meeting, Inst.Ae.E.
Feb. 25	Mr. A. J. Cobham. "Long-Distance Aeroplane Flights," before R.Ae.S.
Mar. 4	Maj. G. H. Scott. "Development of Airship Mooring," before R.Ae.S.

To Our Readers:

Christmas Greetings and Prosperity in the New Year from the Editor and Staff of FLIGHT: with hearty reciprocation to all those who from far and near have sent us welcome reminders of the Season.
Christmas, 1925.

EDITORIAL COMMENT.



SIR SAMUEL HOARE has given us the very neat phrase "Control without Occupation," to denote the manner in which Iraq, thanks to the handing over of the command to the Royal Air Force, is supervised by Great Britain. The phrase very aptly describes a system by which, without occupying a territory, a power is able to police that territory and to maintain in it law and order, a thing which, before the advent of aviation, was only possible by relatively large Army forces costing a great deal of money and tying up large numbers of men who might have been more advantageously employed elsewhere. In its original sense the phrase deserves to stand for all time.

In using the phrase as a heading for these notes, however, we have in mind a somewhat different application, as will be made clear to those who have the patience to read on.

Quite recently, i.e., during the last two or three weeks, there have been signs in aviation circles of a certain restiveness, indicative of dissatisfaction with the manner in which private flying in this country is being handicapped by "red tape," and on many occasions, and in various places, the subject has been raised again and again. We are speaking now of that phase of civil flying applying to the private owner, the man who flies (or rather should we say the man who wishes to fly) his own aeroplane, and who does not desire or contemplate flying "for hire or reward." At the first of the Royal Aero Club's monthly house dinners recently, Mr. C. R. Fairey, covering a few home truths under a mantle of badinage, raised

the subject and pointed out the absurd restrictions applying to a man who wished to fly his private aeroplane from London to Brighton, for instance. Other speakers took up the subject, and it was quite evident that there was a very strong feeling that the stranglehold of officialdom on private flying has at last come to irritate to a point where there is a danger (or a hope, according to one's point of view) that a long-suffering community will not for much longer tolerate the state of affairs obtaining since the war.

At the second Royal Aero Club house dinner last week, the matter of private flying was again raised, first briefly mentioned by Sir Sefton Brancker, as "one of the members of the Royal Aero Club," then by various speakers, and finally by Sir Sefton Brancker unexpectedly reappearing as "Director of Civil Aviation." During these speeches mention was made several times of an article which appeared about a fortnight ago in a Sunday paper, in which a well-known Member of Parliament took up the cudgels on behalf of the prospective private owner-pilot. The article, described by Sir Sefton Brancker as "a monument of inaccuracies," did in point of fact contain a very considerable number of misstatements, but for all that we cannot agree, either with Sir Sefton Brancker or with the Director of Civil Aviation, that such articles do more harm than good.

On the contrary, we hold the view that by his statement the "Hon. and Gallant" writer of the article has probably rendered private flying a signal service in calling public attention to a state of affairs which can best be described as Gilbertian.

Before the war, when there was no Air Ministry to say yea or nay, we had plenty of flying, a great deal of it, if not by private owners as the term is now understood, at any rate by people who were but rarely flying "for hire or reward." Then in 1919 the International Commission for Air Navigation managed to get through a set of rules and regulations, since altered and modified in the main with a view further to secure bureaucratic powers, which regulated all civilian flying whether private or "for hire or reward." Now as regards that class of flying which requires a pilot to hold a "B" licence, few will complain. Many of the rules and regulations are irksome, no doubt, but it is realised that in international flying, and in flying where the general public is asked to pay for conveyance by air, there must of necessity be as nearly uniform regulations as possible in the various countries, and if the regulations in force have tended to retard progress in some instances, it can at any rate be said that they have resulted, as far as Great Britain is concerned, in keeping the standard of our commercial aeroplanes high, and in securing for British aircraft a reputation for sound workmanship and safety so as to make our aeroplanes correspond to the famous "A.1 at Lloyd's."

So far so good. But when we turn to private flying, and more particularly private flying within the shores of Great Britain, a very different state of affairs is discovered. To begin with, no aeroplane

may be flown outside the three miles limit of an aerodrome without having its certificate of airworthiness. The pilot must have his licence, and his machine must be certified for *each* flight by a Ground Engineer, whom the pilot has to pay. The engine itself must be certified airworthy, and the machine must carry log books, etc. In fact, as Mr. Handley Page pointed out at the last Club Dinner, the regulations concerning the private owner-pilot are more on a par—or more so—with those imposed, as regards road transport, upon taxi and omnibus drivers. Again quoting Mr. Handley Page, anyone can get a driver's licence, be he halt and lame, deaf and dumb, but not so with the unfortunate owner-pilot.

At the end of the discussion Sir Sefton Brancker, unnoticed by anyone, had evidently fetched from Adastral House the Director of Civil Aviation, who asked for concrete suggestions, saying that general complaints did very little good. Very well, then. Such suggestions are by no means difficult to give. Mr. Handley Page had already advanced one, namely, that private flying be put, as it was before the war, under the ægis of the Royal Aero Club. The Club has always been able in the past to observe, in its official capacity, a flying pupil when obtaining his certificate, and is well able to do so still without the Air Ministry's blessing. On that score there is no difficulty.

As to the questions of airworthiness of machines, as we have repeatedly pointed out in *FLIGHT*, recognised British aircraft firms can be trusted entirely in the matter of their machines. No British firm is in the least likely to place on the market machines which are not in every way as safe as the machines produced under the official supervision of the Air Ministry. So that the question of an airworthiness certificate can be washed out.

Again, the daily inspection and certificate by a Ground Engineer is merely absurd as applied to private aircraft. On the road there is nothing to prevent a man from driving a car with defective brakes, or with a steering gear which is liable to go wrong at any minute, or any of a thousand and one things that might endanger the general public. If anything goes wrong, and the motorist causes injury or loss of life, he can be, and is, called to account. In the air there is infinitely less third-party risk, since even the private owner would as a matter of course be bound by the regulations governing flying over densely-populated districts. If an owner-pilot did crash and cause material or personal damage he would similarly be called to account. All this red tape is merely hindering progress, and is doing nobody any good. That there is something wrong somewhere is quite obvious from the almost total absence of private flying, and all that has happened is that the officials who are supposed to look after private flying certainly have plenty of control, but they are without occupation because, through a superabundance of control, there is no private flying to control. Let us abandon in the main this multiplicity of certificates, log books, etc., and let the Royal Aero Club take full control of private flying.

Siberia-China Air Service

WHAT will be one of the longest air routes in Europe is being planned for next year, viz., a service from Udinsk, in Southern Siberia, to Peking, via Urga (Mongolia) and the Gobi Desert. The length of this route is about 1,000 miles, and it is expected that the time taken for the complete journey will be 15 hours.

Blackburne "Thrush" passes Type Tests

READERS interested in the light 'plane movement will be interested to learn that the 1,500 c.c. light 'plane engine produced by Burney and Blackburne, Ltd., of Bookham, Surrey, has now passed the Air Ministry's 100 hours' Type Tests, and thus may be fitted to light 'planes for competition purposes.

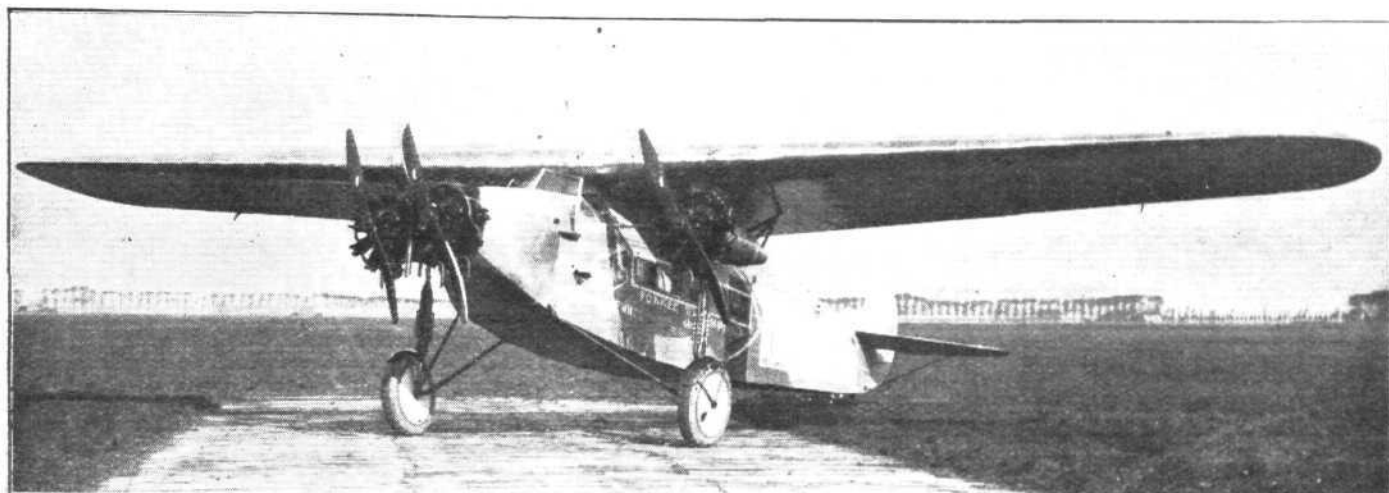
THE THREE-ENGINEED FOKKER MONOPLANE

The Type F VII-3 m.

In our issue of September 17, 1925, we published some photographs and a brief general description of the new Fokker three-engineed monoplane, the type F. VII-3m, which has since done well in America in the Commercial Airplane Reliability Tour for the Ford Trophy. We have now received from the Fokker Company certain further particulars relating to this machine, as well as the general arrangement drawings, and as three-engineed machines are much to the fore at the present moment, we have thought that some data relating to the Fokker might be of interest.

struction have proved it to be easy of maintenance, reliable, durable and largely weatherproof.

From the general arrangement drawings it will be seen that the three-engineed monoplane is of typical Fokker lines with a long fuselage and a monoplane wing of fairly high aspect ratio. The wing section employed is the usual Fokker, which has the characteristic that its lift curve does not show a sharp drop after the critical angle has been passed. In section the wing tapers both in chord and depth, giving a wing of tapering plan form. Ailerons of large span but small

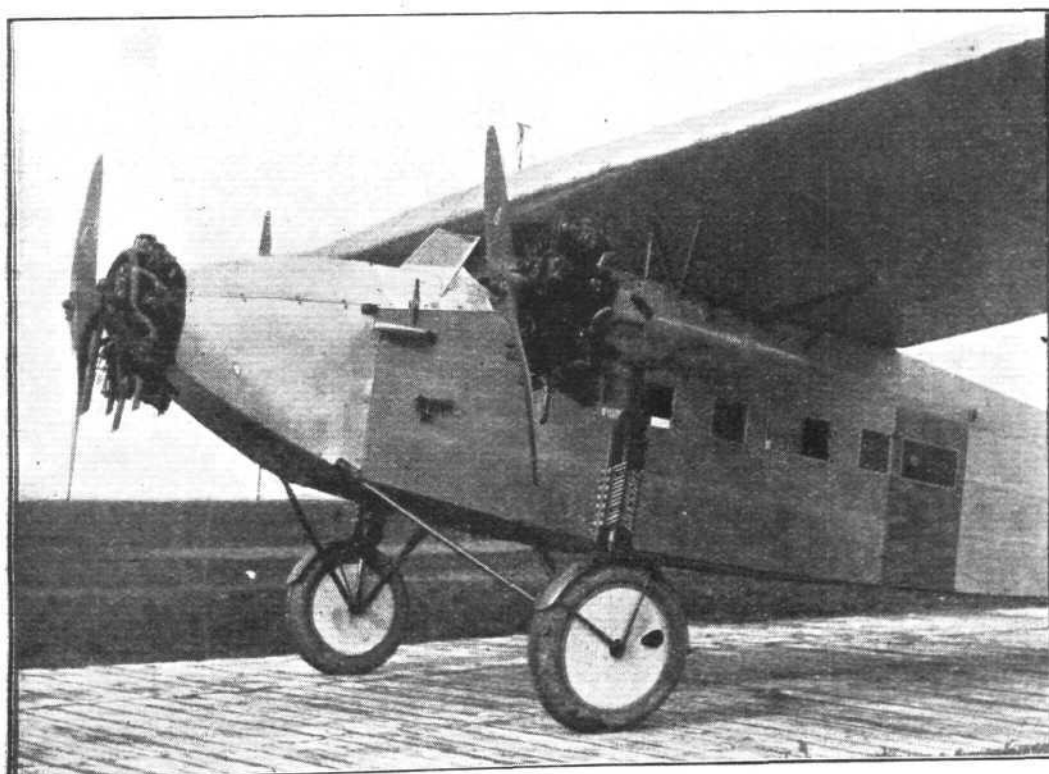


THE FOKKER F.VII-3m: A three-quarter front view. The engines shown in the photograph are Wright "Whirlwinds" of 200 h.p. each, but other engines such as the Armstrong-Siddeley "Lynx," can be substituted.

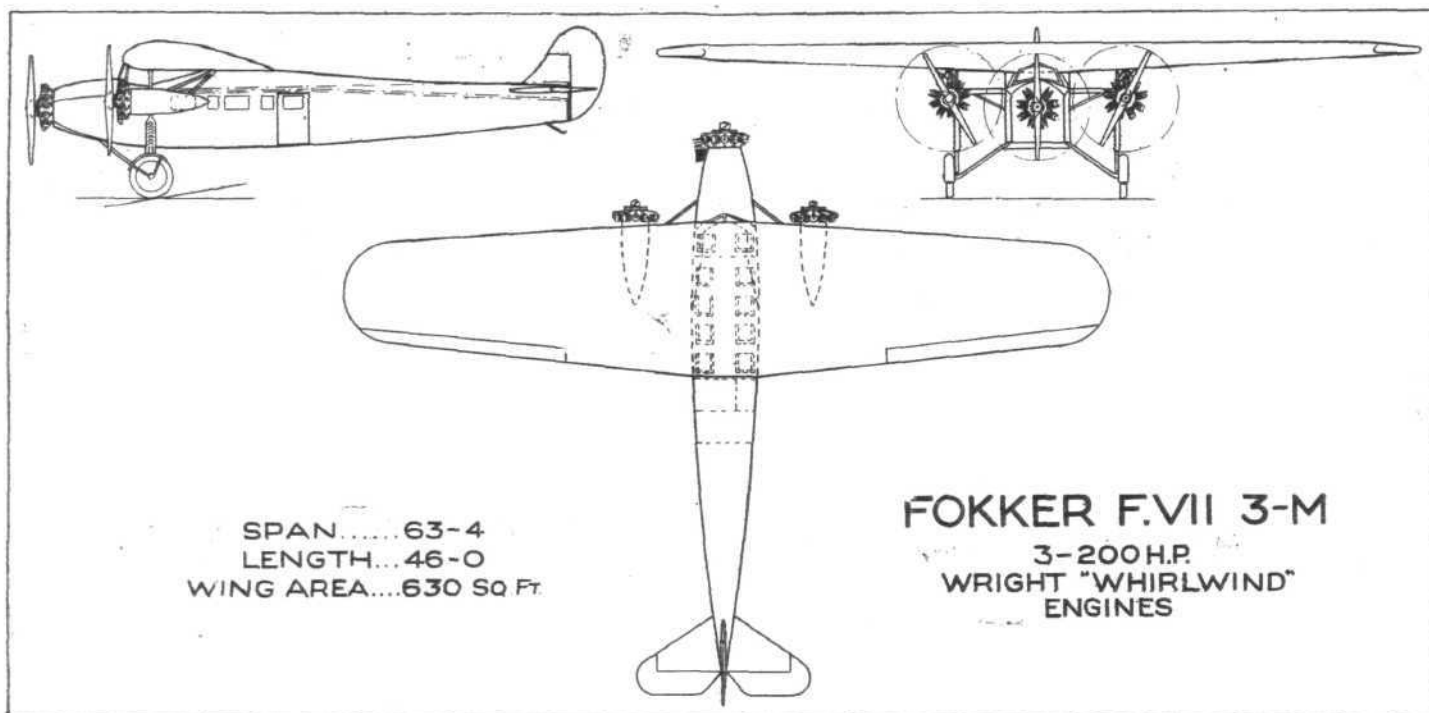
Concerning the constructional features of the Fokker F. VII-3m little need be said, as these follow, in the main, the well-known Fokker practice, which has already been fully dealt with in *FLIGHT* on several occasions. The fuselage is of welded steel tube construction, of which the famous Dutch designer has by now had many years' experience, and which he has so far seen no reason to change, whatever theoretical objections may be raised against it. The monoplane cantilever wing is an all-wood structure, in which the three-ply covering carries part of the stresses. Several years' experience with commercial machines of this con-

struction have proved it to be very effective, although they do not show the horn balance with which the machine on which Fokker gave his non-stalling exhibition at Croydon was provided.

The chief departure from the single-engine F. VII is in the lengthening of the nose of the fuselage to trim the machine with an engine of lower weight than the larger engine with which the older type is fitted. This has been accomplished by a simple framework of steel tubes, and the space thus left between the pilot's cockpit and the engine plate is so large that after removing the cowling a man may easily, while



The Fokker F.VII-3m: This photograph shows the mounting of the nose and wing engines, the pilot's cockpit and the [undercarriage.



THE FOKKER F.VII-3m. COMMERCIAL MONOPLANE: General arrangement drawings to scale.

standing on the ground, reach the back of the engine and make any adjustments necessary to the engine accessories mounted there.

The wing engines are supported from the wing by a system of steel tubes, there being two points of attachment on the front spar and one point on the rear spar. The front supports are in the form of a letter N, in the plane of the spar, while the rear struts are in the form of a sharply-sloping tripod. This form of mounting is somewhat unusual for a radial engine, as these tubular struts do not carry the engine direct, but support a horizontal steel tube framework to the front of which the engine is secured. The arrangement may be seen in the photographs. The engine bearer structure is enclosed in a streamline casing, in which the oil tank is housed, but there is no cowling around the engine itself. The petrol tanks are carried in the centre of the wing, with pipes running to the three engines and supplying them with fuel by gravity feed. The cabin has seating accommodation for eight passengers, and a cockpit ahead of the leading edge of the wing is arranged for two pilots.

A novel feature made desirable by the fitting of three engines is the provision of a trimming tail fin, the object, of course, being to relieve the pilot of the necessity of constant ruddering when one wing engine is out of action.

The undercarriage is similar to that of the F.VII, but the telescopic legs run to the "power eggs" instead of to the wing itself, and are thus somewhat shortened. The track is wide—about 14 ft.

The overall dimensions of the F.VII-3m are shown on the general arrangement drawings, but it should be stated that the machine is fitted with two types of wing, one the same as the F.VII (improved type) as regards area, but having, of course, local strengthening where the wing engines are attached, and the other a larger wing (by some 86 sq. ft.) which enables the machine to carry approximately 500 lbs. more paying load at some sacrifice in speed.

The weight of the F.VII-3m is 4,750 lbs., and the total useful load is 3,200 lbs., made up as follows: Two pilots, 350 lbs.;

fuel for 3½ hours at full throttle, 1,150 lbs.; oil for 4 hours, 130 lbs.; eight passengers with luggage, 1,570 lbs. The total loaded weight is thus 7,950 lbs., which, with a wing area of 630 sq. ft., gives a wing loading of 12.6 lbs./sq. ft., and with a total power of 600 h.p. the power loading is 13.3 lbs./h.p. The machine is normally fitted with three Wright J.4 "Whirlwind" engines of 200 h.p. each, but other radials of about the same power can be supplied, and it is of interest to note that the British Air Ministry is reported to have ordered one of these machines fitted with Armstrong-Siddeley "Lynx" engines.

The following performances relate to the machine as fitted with the "Whirlwind" engines: Maximum speed at ground level, 125 m.p.h.; cruising speed, 106 m.p.h.; landing speed 47 m.p.h.; duration at cruising speed, approximately 5 hours; climb to 1,000 ft. in 1.2 minutes; to 5,000 ft. in 7.25 minutes; to 10,000 ft. in 16.5 minutes; and to 15,000 ft. in 38 minutes. The practical ceiling is 15,500 ft.

It is of interest, in view of the wide difference between the two types of machines, to compare some of the Fokker figures with those of the Handley Page "Hampstead." The Fokker wing loading is 12.6 lbs./sq. ft. and that of the "Hampstead" is 8.35 lbs./sq. ft. The power loading of the Fokker is 13.3 lbs./h.p. and that of the "Hampstead" is 12.55 lbs./h.p. The paying load of the Fokker for a distance of approximately 450 miles is 2.62 lbs./h.p. and for the "Hampstead" 2.78 lbs./h.p. The rate of climb appears to be roughly the same for the two machines, and one thus finds that, in spite of the fact that one machine is a cantilever monoplane of 8,000 lbs. loaded weight and the other a biplane of 14,500 lbs. loaded weight, the performances and the useful loads per horse-power are very nearly identical. In view of the question monoplane or biplane it is rather interesting to find two concrete examples which seem to indicate that there is little to choose as regards efficiency between the two types. Assuming the Fokker speed figures to be correct, and we have no reason to doubt them, the monoplane seems to score somewhat on the point of speed, both maximum and cruising.

London-Cape Town Survey Flight.

ALAN J. COBHAM, who is engaged on an important survey flight from London to Cape Town in a D.H. 50J (Siddeley "Jaguar"), left Cairo at 9.15 a.m. on December 16, and with a strong following wind covered the 420 miles to his next stopping place, Luxor, in four hours. Here the famous temples and tombs were visited and filmed. On December 18 he left Luxor shortly after 8 a.m., and at 9.30 a.m. landed at Assuan, having obtained a magnificent and wonderful view from the air of the great dam. Continuing on December 20, Cobham next made a 2½-hours flight to Wady Halfa, but left again next morning for Atbara (Sudan). Thus, since he left Cairo, Cobham has covered about 1,000 miles in six days—a nice little spurt.

French Civil Aviation.

M. LAURENT EYNAC, Under-Secretary for Air, during the debate in the Chamber on December 18, stated that whilst in 1923 the receipts from the French Commercial air lines amounted to 17 per cent. of the expenditure, and 24 per cent. in 1924, in the first nine months of 1925 they were 60 per cent. The Paris-London line was run with extraordinary regularity and showed a profit of 600,000 fr. New services were to be opened between Lyons-Zurich, Marseilles-Algiers, and Bordeaux-Madrid, whilst it was probable that as a result of recent conversations in Paris regarding Franco-German flying, some of the big air routes, such as Paris-Prague, would be considerably shortened as more direct routes would be possible.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, December 16, 1925, when there were present:—Lieut.-Col. F. K. McClean, A.F.C., in the chair, Mr. Ernest C. Bucknall, Lieut.-Col. M. O. Darby, Wing-Commander T. O'B. Hubbard, M.C., A.F.C., Mr. F. Handley Page, C.B.E., Mr. T. O. M. Sopwith, C.B.E., and the Secretary.

Election of Members.—The following new Members were elected:—

Major George Purvis Bulman.
Frank Albert Kappey.
Archibald George Hazell.
Francis Trounson Hearle.
Flying-Officer Francis Llewellyn Hudson.
Squadron-Leader Edward Radclyffe Pretymen.
Flying-Officer Geoffrey Charles Stemp.
L. N. Glaisby.
I. H. M. Brown.
J. de la Cierva.

Schneider Cup, 1926.—Correspondence between the Club and the National Aeronautic Association of U.S.A. was submitted. The consideration of the regulations for the next race was deferred pending the receipt of further information from the National Aeronautic Association of U.S.A.

F.A.I. Conference, Paris.—Lieut.-Col. M. O'Gorman, C.B., and H. E. Perrin were appointed to represent the Club at the F.A.I. Conference, Paris, on January 11, next.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

7976. Robert Milton Stobie. November 23, 1925.
7977. Geoffrey Hilton Bowman. June 27, 1916.

Official Observers.—The following officials were appointed to observe tests for Aviators' Certificates in the districts of Manchester and Newcastle:—

Manchester: Mr. J. F. Leeming.
Newcastle: Major B. M. Dodds and Mr. A. E. George.

Aero Club of Belgium.—Mr. F. Handley Page was appointed to represent the Royal Aero Club at the official banquet of the Aero Club of Belgium to celebrate their 25th anniversary on January 9, 1926.

SPECIAL GENERAL MEETING

A SPECIAL general meeting of the members of the Club was held at the Club Premises, 3, Clifford Street, London, W. 1, on Wednesday, December 16, 1925.

The Chairman (Lieut.-Col. F. K. McClean) and Mr. F. Handley Page having explained the financial position, both as regards the Club and its Special Racing Fund for the year 1926, the resolutions authorising the increase of subscription were unanimously agreed to.

The subscriptions due on January 1, 1926, are now as follows:—

	£	s.	d.
Ordinary Members	6	6	0
Service Members (R.A.F., R.A.F. Reserve and Air Ministry)	3	3	0

ROYAL AERO CLUB SPECIAL RACING FUND

In response to the appeal issued by the Chairman (the Duke of Sutherland), the following donations have been received:—

	£	s.	d.
Ernest Pitman	5	0	0
Arthur E. Savill	5	5	0
Wing-Com. T. O'B. Hubbard	5	0	0
Sir Mortimer Singer	10	0	0
Lieut.-Col. F. K. McClean	5	0	0
Lieut.-Col. M. O. Darby	5	5	0
T. O. M. Sopwith	5	5	0
Sir Sefton Brancker	10	0	0
Oswald Short	10	0	0
Capt. C. B. Wilson	2	2	0
Harry Preston	2	2	0
Air-Commodore J. G. Weir	100	0	0
A. S. Butler	100	0	0
Lord Edward A. Grosvenor	2	2	0

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary

CIVIL AVIATION

Discussion at Royal Aero Club Second Monthly House Dinner

THE subject for debate at the second of the Royal Aero Club's House Dinners last week was "Civil Aviation," the debate being opened by Air Vice-Marshal Sir W. Sefton Brancker, Director of Civil Aviation. His Grace the Duke of Sutherland was in the Chair, and said he hoped that, in addition to the well-known speakers who were taking part in the discussion, he hoped that "incognito" speakers, who often had very valuable views, but who never got up to express them, would make an exception and would take part in the discussion that evening. He then called upon Sir Sefton Brancker to open the debate.

Sir Sefton Brancker said he was glad to say that the Director of Civil Aviation was not present that evening. He had left him at the Air Ministry, and proposed to speak as a member of the Royal Aero Club. He proposed to divide his subject into four sections—Commercial Aviation, Racing, Aerial Survey, and Private Flying.

On the first subject Sir Sefton did not tell his listeners very much that was new. He gave a few statistics, such as that British air transport machines had now flown 4½ million miles, and but four accidents resulting in death of passengers had occurred. In America they had flown 1,800,000 miles at a cost of £600,000, which, he thought, was higher than the British cost. In America they were making it an education of the public, and there were now firms who maintained that commercial aviation could be made to pay, and America was now calling for tenders for air services. The question would naturally be asked whether we in this country should have done better by starting with longer lines, rather than confine

ourselves at first to the London-Paris, etc., route. There could be no doubt that our air lines had raised British prestige.

On the subject of racing Sir Sefton said he did not propose to say much, except to point out that there had been a lamentable lack of public-spirited support. In Germany last year they got together from private subscribers no less than £15,000 for their *Rundflug*.

Concerning Aerial Surveying, Sir Sefton said this was a branch in which Great Britain led the world, and was a branch able to carry on without subsidies. The only branch able to do so. It was absolutely beyond criticism.

Turning to the subject of the private owner, Sir Sefton referred to an article which had appeared in a Sunday paper recently by a distinguished member of Parliament, and which he described as "a monument of inaccuracies." This sort of thing did more harm than good. They should all get together to see what could be done to help.

Lieut.-Col. Moore-Brabazon ("Ticket No. 1") found it very remarkable that Sir Sefton could speak on civil aviation three times a week and still be able to be interesting. He himself, unfortunately, had come to be regarded in certain circles as an "air expert," which was somewhat embarrassing when the view came from people who regarded as an "expert" anyone capable of telling a monoplane from a biplane. He did not think the man in the street realised the danger of other means of transport, and he personally doubted if road and rail transport were as safe as air transport. He did not think that even if they got 100 per cent. reliability

very large numbers of people would travel by air. The man in the street did not see aviation enough. Would it not be possible, by some means, such as the de la Cierva "windmill" machine to start from and alight in towns themselves? He was interested recently in finding that in a particular survey required the Admiralty insisted that it must be an aerial survey. That was significant.

Mr. Sopwith said he had just asked Sir Sefton whether he was going away for a holiday, and had been told that Sir Sefton proposed, instead of taking a holiday, to go on a tour through Ireland, and later to Canada and America. Concerning private flying something ought to be done, and we ought to have in this country more than the three or four privately-owned aeroplanes which comprised our private flying stock at present. As regards civil aviation, he was afraid that this was rather too safe—from the aircraft constructors' point of view—as machines seemed to last for years. They would have to find some way of making it less safe. (Laughter.)

Major C. C. Turner caused a good deal of amusement by saying that he preferred to regard Sir Sefton Brancker as a doctor with excellent bedside manners, who was in attendance on Miss Aviation. If he went to see his patient and there was some little trouble, the "doctor" never let the patient realise that there was any trouble, and cheered her up with breezy remarks. Reference had been made to the French railways as compared with aviation for safety. He did not think it wise that the comparison be taken farther, as some surprises might be unearthed. Concerning the new basis of subsidies which was, he understood, about to be questioned in the House of Commons, he gathered that this was to be based upon horse-power miles, and would like to know why this basis was chosen, as it would appear to encourage the reduction of the number of journeys, while what was wanted was to increase the number of trips.

Mr. Oswald Short said he was one of those people who, when they got on their feet, felt their tongue cling to the roof of their mouth. He had in the past often asked himself whether the machines on which we spent so much thought were ever going to pay. He was now convinced of the ultimate success of aviation. The day might come when we should find some way of making use of the enormous forces in the atmosphere, but until then we had to use the knowledge we possessed. To get away from old ideas required courage, but in certain foreign countries, and particularly in one not so very far away, they were going on totally new lines. One day they would get away with it, and then flying would be revolutionised. He gave an account of the manner in which he was received in America some years ago when he took a new design over there, and met the technical chief at once, discussed the design, and had a signed order for the machine before he left. If something of this sort could be done in this country progress would be more rapid. As regards the

future, if research was to be restricted the outlook would be black. What was wanted was experience, not committees. He would plead for freedom for designers to produce new types unfettered by official interference.

Mr. Holt-Thomas referred to the opinion that a London-Paris service could not pay. He did not agree. It could if one carried mails instead of passengers. The present passengers he described as "joy riders" rather than serious air travellers. He expressed the view that if the French had not subsidised their lines in the early days we should not have done so either, and should by now have got aviation to pay. By using the air mail in America as much as 30 hours was saved. We could, on an air mail line to Australia, save 30 days. Much was being said nowadays about three-engined machines. The American air mail was the most efficient in the world, and they used single-engined machines. For air mails one wanted smaller machines. He also referred to the activity of the French Air League and propaganda, and said it was time the British Air League woke up.

Mr. F. Handley Page said that as regards the article to which Sir Sefton Brancker had referred, he had read it with great interest, although it contained inaccuracies, and thought it would do good in bringing home the ridiculous restriction. On the road, anyone, halt, lame, deaf or dumb, could get his driver's licence. In the air there was a stranglehold, whether a man flew for profit or pleasure, and he did not see why the private flying in Great Britain, so long as it was confined to this country, should not be under the Royal Aero Club as in pre-war days.

Major H. Hemming referred to the excellent work done by Canada in photographic mapping and fire fighting. In many parts of the Empire similar or other uses could be found for aviation, and which would pay without subsidy. We were not, as had been stated, leading in air survey. Canada and the United States had taken the lead in that. In private flying we should remember that supervision was the death of enterprise, and we should send up a shout for freedom in private flying.

Capt. Barnard deprecated the attitude of talking about air travel as safe when we knew it to be the most unsafe of all methods. We should admit the risks and overcome them. Flying in fog was one subject to be tackled.

Capt. Sayers said the failure to attract passengers was more serious than the economy of the machines used. Flying was a new tool, and should be used for purposes for which no existing tools were suitable.

Major F. A. de V. Robertson said Australia offered a field for Capt. Sayers' suggestion as to useful work for aviation. What had been lacking in the past as regards British lines was publicity. If three-engined machines materialised and gave reliability, it should be possible to get the mails.

Mr. Colebrook said aviation did not pay because it was not safe and not reliable. These were the main considerations.

LIGHT 'PLANE

London Aeroplane Club

An informal dinner was held on December 18 at the Chanticleer Restaurant, Frith Street, when about fifty members were present. After dinner, Maj. Beaumont, who was in the chair, announced that a fund had been raised for the staff of the London Aeroplane Club, and pointed out that the following work had been done: days' flying between August 19 and December 1, 72; total flights, 729; total hours flown, 298½.

Of these flights, 529 were dual and 63 were solo; 128 were test flights; nine joy-rides were given.

The chairman then called upon Mrs. Elliott Lynn to make the Christmas presentations which had been obtained for the Club staff.

Mr. Perrin, the Secretary of the London Aeroplane Club, who before the opening of the club and since has put in the solid and constructive work that has made it a success, was the recipient of a large silver frame containing a photograph of one of the Club machines, D.H. "Moth" Gebu.

Mr. Sparks, the chief instructor, whose continual cheerfulness and hard work has made the Club, as a visitor described it, the most amusing as well as the most efficient in the world, was given a gold cigarette-case, 500 cigarettes to put in it, and a box of safety matches. Mrs. Sparks, who was unavoidably absent through an injury to her foot, was sent a box of chocolates. Mr. Witcombe, the second instructor, who was also unavoidably absent, was presented with a gold match-box.

Mr. Michie, the ground engineer, who has, single-handed, kept both machines in the air for the past five months (it sounds rather like a feat of strength), received a cheque to assist him on his journey to Scotland for Christmas.

Maj. Beaumont, as chairman, announced that a fund had been raised to buy some permanent and tangible marks of appreciation for those members of the staff of the London Aeroplane Club with whom the members so frequently came in contact. Suggestions had been taken from all the members, and consequently the gifts which were presently to be presented, had been bought.

First of all, there was Mr. Perrin, whom he had known for two years, having first met him at an air race meeting, when Mr. Perrin lost a bet to him which he had not yet paid up. He stated that Mr. Perrin was in the position of holding Moths for disposal in the one hand and the iron heel of authority in the other. He trusted that Mr. Perrin would soon release the Moths and would cover the iron heel before putting it upon our necks. He touched briefly on the splendid work done by Mr. Perrin in what he considered his capacity as honorary secretary, both before and since the formation of the club.

CLUB DOINGS

Speaking of Mr. Sparks, he said that he considered him the corner-stone of the whole club, not alone in flying, but by his cheery helpfulness on the ground, where he radiates an atmosphere of happiness and comradeship which makes the Saturdays and Sundays on the aerodrome things to be looked forward to and back upon during the week. If Mr. Sparks continues as he has begun with the club, Maj. Beaumont was quite sure that the aerodrome would not be large enough to hold the numbers of people who would flock down there during the spring and summer. This happy condition was due entirely to Mr. Sparks. Although they were too many to fly as much as they wanted, Mr. Sparks had never failed to be extraordinarily tactful both on the telephone and verbally, at all times, and had managed to please everybody without seeming to exercise too much control. The proof of the pudding was in the eating, and his efficiency was shown by the way he taught people to fly.

Turning to Mr. Witcombe, Maj. Beaumont trusted that he would soon be with them again. Mr. Witcombe, he stated, had most loyally supported Mr. Sparks in his work, and proved his extraordinary efficiency in the air, although his flying activities were slightly complicated by being engaged—an affair which always upsets one, physically or morally. He had inspired all the members of the club with the utmost confidence and feelings of esteem.

Then, with regard to Mr. Michie, the ground engineer, he held an unenviable job, especially in winter, messing about with cold machines in a cold shed, and any glory he got was reflected. It was entirely due, however, to Michie's efforts that the club had the confidence it had in the machines. He loved his machines and his aeroplanes, and we, who trusted our lives to him every day, did very heartily appreciate his efforts.

The London Aeroplane Club wished to keep in friendly relations with all the other aeroplane clubs, and, consequently, had prepared a number of pictures of Moth machines, which had been painted by Mr. Bradshaw, framed, and were being sent out to the following:—

The Lancashire Aero Club; the Midland Aero Club; the Newcastle-upon-Tyne Aero Club; the Yorkshire Aero Club.

Maj. Beaumont also mentioned that a balance sheet, which had been prepared by Mrs. Elliott Lynn with regard to the expenditure, was in his possession, and could be inspected by any members who so desired.

It had been suggested to him that the club should have club colours, and he was anxious to know what the members thought of stripes of Oxford and Cambridge blue separated by a gold band. He further hoped that members would endeavour to make the dance at the Suffolk Galleries on January 13 a tremendous success.

Mrs. Elliott Lynn then presented the Christmas gifts to the members of the staff.

In replying, Mr. Perrin said that he thought his greatest success with the club was making his old friend Sparks chief instructor. Some years ago, at an aeroplane race meeting, a man turned up from Wales with an old Avro which he had streamlined, and this man won £300 in prizes, took £70 off the bookmakers, and diddle the handicappers. That man was Sparks, and he was more than happy that the club had got him. Sparks had said that perhaps a fellow called Michie would be valuable as ground engineer and the Air Ministry had told him that Michie was the best man they could possibly have if they could get him. So they got him.

Sir Samuel Hoare was very pleased with results and with the excellent performance of the Moth. There had only been one slight accident in a bad landing since the club had started. He was very glad to hear of this dinner and presentation, proving that the club members thoroughly approved of the committee's choice of staff. "I have been 20 years," said Mr. Perrin, "Secretary of the Royal Aero Club, and they never made me a presentation in all that time, so I am specially grateful for yours and will see that the Aero Club knows all about it."

Mr. Sparks, in thanking the club for his presentation, said that the first time he heard about the club he always wanted to come and help and that he was very glad to have the privilege of doing so. A lot of old pilots had told him that the club was doomed to failure, but he was proud to show them that it was not. Did we know that the famous Italian airman at present visiting London wanted to see some flying on Sunday, and that the London Aeroplane Club was the only place in England where they could see it? He was glad the club appreciated Michie, as it was much more romantic to hold a joystick then to hold a cold spanner. He looked forward to the time when the club had would be possible, and he hoped the members would not retaliate for the fact that they were kept out of the staff room at present by putting "members only" over their door when they got it.

Mr. Michie thanked the club very much and was very pleased that he had been able to satisfy them. He said he was quite happy to help that keenness for flying with which the club was imbued. He was glad to see that it had lasted so long and he was sure that it was going to continue to last. He did not agree with Maj. Beaumont that there was not very much glory; he had all the glory he wanted in the respect and esteem of the members and looked forward to carrying on.

Mrs. Sherwood Kelly, in proposing "The Health of the Club," said that she liked the rendezvous—it suited the club. Coming up the stairs was going higher and higher, and we finally dined at a high altitude. The decorations round the room of fighting cocks made her think of birds and other flyers. Great Britain, she said, had come to a parting of the ways, with America and the Continental nations advancing in leaps and bounds in matters of aviation. What with the congestion of traffic and with foot and mouth disease destroying the hunting, we would all be driven into the air shortly. In the past we had been galvanized into looking upon the sea as our only means of expansion, but she was sure the club, and what it stood for, was one of the surest means of making Britain "mistress of the air."

Flight-Lieutenant Reid, in replying for the Club, said that he was a very timid man, and was further frightened at the beginning of dinner by seeing police uniforms present (these were worn by Commandant Allen and Inspector Taggart, two very active lady members of the club).

Talking of Mr. Perrin, the way he had stuck a wing on the Moth that had a biff last week was typical of the way he did things. He was really responsible for the club, he and the fine instructors. The keenness of the members was also a great factor in its success. Among other things the club had proved that women could fly as well as men.

He pointed out that this was the first dinner of the London Aeroplane Club—he hoped that in future the number of guests would be hundreds instead of tens. The flying side of the Club was well developed, but he hoped to see the social side developed very strongly in the future.

Questions were then invited and Mr. Victor Doree offered to put up £20 towards getting a new machine if some other members of the Club would put up similar sums to reach the price of a Moth. Major Beaumont, Mr. Hay and Mr. Wight immediately offered to do so, and Mr. Pollard and Mrs. Elliott Lynn offered to share a £20 donation. The Club sincerely hopes that some branch of the Press would take this matter up and assist the Club to obtain some outside contributions.

Mr. Hay asked if other types of machine could be bought and Mr. Perrin replied that the question of an Avro Baby was under discussion at the moment, engined with the spare Cirrus. He also stated that it was possible the Club might move to Hendon in the near future as that was a Government aerodrome. Mr. Hay inquired whether it would be possible to remove the permanent fog which hangs over Harrow Church as the chief instructor never allowed flying unless the Church could be seen from the Aerodrome. Mr. Sparks said he would look into this.

Mr. Victor Doree, being persistent, asked if it would be possible to buy a machine on the hire purchase system. Mr. Sparks replied that unfortunately Mr. Doree did not supply aeroplanes. Mr. Wight suggested that if a standard machine was passed for all aeroplane clubs it would cheapen the production

and members could obtain parts and build machines themselves. Mr. Perrin stated that after the Lyne meeting on August 26, more machines and probably cheaper ones would be available.

Mr. Johnson asked if arrangements for light aeroplane club races were being made, and whether members could fly, and also if a venue less far than Lyne could be arranged. Mr. Perrin replied that possibly competitions in which members would certainly be encouraged to fly might be held at Croydon or Hendon.

Mr. Johnson suggested that as the Club hut could be obtained for £50, and the cost of erection was about £20 and consisted of unskilled labour, possibly that unskilled labour could come from among the members.

Mr. Hulbert inquired when "A" licences were going to be allowed to carry passengers. Mr. Perrin stated that he agreed with Mr. Sparks that it was better to say no to that sort of thing at present.

Mr. Sparks asked if Mr. Perrin would draw the attention of the Aero Club and the Air Ministry to the fact that London is the capital of England and should have preference in any light machines to be distributed among Aero clubs. He pointed out that the population of London was very much greater than the population of any other town which had aeroplane clubs with the same number of machines as ours.

The proceedings concluded with a vote of thanks to the Chairman.

The total flying during the week was 10 hours 40 minutes. All through the week the weather was unfavourable and it was only at intervals that instructional flying could be given.

The following Members received flying instruction:—L. J. C. Mitchell, Col. Turner, E. D. Moss, Mrs. Atkey, W. Hay, T. C. Elford, Miss O'Brien, C. E. Murrell, J. S. M. Michie, Major Beaumont, R. C. Presland, S. Bradshaw, E. Brough.

The following Members flew solo:—Mrs. Elliott-Lynn, Major Beaumont, G. H. Craig.

G. T. Whitcombe, pilot instructor, has returned to duty.

The A.D.C. Aircraft Co., Ltd., has kindly presented the Club with a sectioned Beardmore Engine. This will be used for instructional purposes to show the internal working parts of an aircraft engine.

There will be no flying during the Christmas Holidays. Flying will be resumed on Tuesday, December 29, 1925.

Lancashire Aero Club

Flying took place on Wednesday, Friday, Saturday and Sunday. The weather has been bad, with low clouds all the week.

Mr. Cantrill gave instruction to: A. Goodyear, 20 mins.; H. Hardy, 1 hour, 30 mins.; P. Nicholson, 40 mins.; W. Colley, 25 mins.; J. Wilkinson, 10 mins.; D. Tummers, 15 mins.; C. Parker, 15 mins.

Mr. Scholes gave instruction to: S. Crabtree, 35 mins.; A. Macnair, 55 mins. J. F. Leeming, 35 mins.; H. Shera, 1 hour.

Solo flights were made by M. Lacayo, 25 mins.; J. Wilkinson, 45 mins.; J. Leeming, 15 mins. Tests occupied 45 mins. Total solo, 1 hour 25 mins.; dual instruction, 6 hours 40 mins.; total time, 8 hours 50 mins.

There will be a special day for general members on Boxing Day, December 26, when it is hoped as many members as possible will try to be present.

Newcastle-upon-Tyne Aero Club

TOTAL flying for week ending December 20: L.N., 7 hours 8 mins.; L.Y., 20 mins. Total 7 hours 28 mins. This has been a particularly unfortunate week, with either gales or snow, or both, throughout. In spite of the snow-storm on Monday, Mr. W. T. Walton put in one hour dual with Major Packman. On Tuesday he again got in 1 hour 35 mins. in two flights (dual), making a number of very successful practice landings. Mr. J. D. Irving had one hour's instruction, also making excellent practice landings.

The weather on Wednesday being slightly better, an improved attendance resulted. Mr. Walton and Mr. Irving each had one hour, Mr. H. H. Leech 30 mins., Mr. W. Todd 15 mins., and Mr. W. M. Mackay 18 mins. secondary dual and 15 mins. solo. A five minutes' test completed 3 hours 23 mins. for the day.

A gale blew all day on Thursday, and in the afternoon Major Packman proceeded to London for renewal of his licence. Friday was, of course, a blank day owing to his absence and, in any case, it was still blowing a gale.

Saturday brought a fresh snowstorm, but Mr. L. Smith braved it for half an hour (dual). Sunday, snowstorms all day.

Last week's report stated that engine No. 13 was to be overhauled. This, of course, will only be a top overhaul. There were no indications that this was necessary, but it is considered that it ought to be carried out on account of the time the engine has been running. The object in changing engines being to keep the "Moth" in service and allow of work on the engine being carried out as circumstances permitted.

A good number of members and friends spent an enjoyable evening on Wednesday, when the first monthly whist drive was held. Miss B. Stephenson won the lady's prize and Major Brian M. Dodds beat all the other gentlemen by several fuselage lengths.

The total flying time given in last week's FLIGHT of 12 hours 31 mins. was of course, an error, and should have read 19 hours 31 mins.

ROYAL AIR FORCE MEMORIAL FUND

THE last meeting of the Executive Committee of the above Fund was held at Iddesleigh House on December 16. Lord Hugh Cecil was in the chair, and there was a large attendance of members of the Committee.

The Hon. Treasurer had the pleasant duty of informing the Committee that he had just received, through the kindness and generosity of the Air Council, a splendid donation, being the result of the R.A.F. Display held at Hendon in June last, and the Chairman wrote a very appreciative letter to the Air Council, thanking them for their continued and greatly valued help.

The Hon. Treasurer announced his absence in India from January to March next, and the Committee unanimously approved of his duty, as Acting Hon. Treasurer, being performed in his absence by Lieut.-Comdr. H. E. Perrin.

It was reported that between October 21 and the date of the meeting the Grants Sub-Committee had dealt with 40 cases, and that within the same period the Secretary had dealt with 68 cases.

A further application for assistance, in an educational sense, from the Salting Benefaction was put forward for

approval by the Grants Sub-Committee, and on behalf of the widow of an officer of the Air Force, recently accidentally killed, and the recommendation to make a grant was approved by the Executive Committee.

The Secretary announced to the meeting that, in accordance with the Committee's request, Air-Chief Marshal Sir H. M. Trenchard, Bart., G.C.B., Chief of the Air Staff, had laid on the R.A.F. War Memorial on the Victoria Embankment, the wreath provided by the Fund, and in memory of the fallen of all ranks during the Great War. This ceremony took place at 11.30 a.m. on November 11 last, being Armistice Day.

The Secretary was directed, as usual, to prepare an annual report for the current year and to issue 1,500 copies in due course.

As was done in the current year, the Committee approved of certain dates for meetings during the forthcoming year subject, of course, to alteration if required. The dates tentatively approved are as follows:—

Wednesday, February 10.	Wednesday, July 28.
" April 21.	" October 13.
" June 9.	" December 15.

SOVIET AIR LINES IN CENTRAL ASIA

IN the August issue of the *Soviet Press* (Russia) some very interesting information is published regarding the aerial activities carried out by Soviet Russia in Central Asia, or Turkestan. Possibly few of our readers are aware of the fact that aviation has during the last year or two, played a small but none the less important part in this somewhat isolated region, with, it would seem, some considerable advantage to the commerce of the districts served. Therefore, we think the following particulars, from the source referred to above will be of more than usual interest.

Firstly, an article by A. Onufrieff describes the work carried out by the Dobrolet in Turkestan and the adjacent autonomous republics. Hitherto all mails, goods, etc., in this part of the world were either carried by camels or horses, or else were water-borne, and in consequence this naturally took a considerable amount of time. Furthermore, valuable goods were exposed to the risk of raids by bandits lying in wait—a by no means uncommon occurrence in Afghanistan. Again, the bed of the Amu Daria river—one of the principal waterways in the locality with which we are dealing—is constantly shifting, and boats which are in the fairway at night frequently find the river bed has shifted during the night, with the result that they are stranded in the morning with the river probably about a mile away! With conditions such as these prevailing it will be seen that the air services planned and operated by the Dobrolet are of considerable importance to the whole of Central Asia.

Plans for air services were first drawn up in 1923, but no service was operated until 1924, when the following three services were opened:—(1) Tashkent-Alma-Ata (813 kms.). (2) Kagan (Bokhara)-Khiva (467 kms.). (3) Kagan-Dushambe (730 kms.). The erecting of hangars at Tashkent and Alma-Ata and the establishment of aerodromes at Kagan, Khiva and Dushambe cost 133,050 rbls., while, during 1924, eight Junkers XIII passenger aeroplanes were acquired, at a cost of 342,158 rbls., for operating these three lines.

Between May 1 and December 31, 1924, the services were operated as follows:—Scheduled and special flights—187. Passengers conveyed—1,316. (Of these, 809 were paying passengers, 146 were officials, and 361 were conveyed free of charge). Mails and goods carried—5,017.78 kgs. Total number of hours flown—946. Total distance flown—135,784 kms. The receipts amounted to 211,156 rbls. and the total deficit was 242,000 rbls.

This deficit was largely due to the fact that the period 1923-24 was taken up in organising and operating the air services, on a somewhat large scale, for the first time. Also, the Dobrolet made many mistakes, such as, for instance, operating an air line parallel with the railway from Tashkent to Alma-Ata, which proved a failure, while the services were not operated regularly and the traffic was therefore limited.

Later, plans were made for additional services, i.e., Tash-

kent-Samarkand and Poltorack-Tashaus, while a scheme was considered for approaching the Kirghiz Republics with a view to establishing air lines between Pishpek-Werny-Lepsinsk-Serigiopol-Semipalatinsk. This service possessed great economic significance not only for the Kirghiz Republics but for all Eastern Territories, uniting Central Asia with Siberia.

Elsewhere in the same issue of the *Soviet Press* some particulars are given of more recent activities. In January, 1925, the air lines were reorganised and the Tashkent-Alma-Ata service was closed down. The lines then consisted of the following:—(1) Pishpek-Alma-Ata (246 kms.); (2) Khiva-Bokhara (Kagan), (460 kms.); (3) Bokhara-Dushambe (730 kms.); in all, 1,436 kms.

No regular service is operated on the Pishpek-Alma-Ata line, but when in operation the route is covered in 1 hr. 45 min., and the passenger fare is 60 rbls. On the Khiva-Bokhara line the service is operated three times a week in both directions, and the distance covered in 3 hrs. 20 min.; the passenger fare is 135 rbls. This line has now been extended to Tashaus (60 kms. from Khiva), and the passenger fare from Kagan to Tashaus is 155 rbls.

On the Bokhara (Kagan)-Dushambe line a service is operated three times a week in both directions. Machines leave Bokhara (Kagan) and Dushambe on Wednesdays, Saturdays and Mondays, and leave Termez for Bokhara on Tuesdays, Thursdays, and Sundays. The passenger fare from Bokhara (Kagan) to Dushambe is 180 rbls., from Kagan to Termez 135 rbls., and from Termez to Dushambe 100 rbls. It is proposed to extend this line from Dushambe to Kuliaba, a distance of 150 kms.

The figures for these three lines, from January to June, 1925, are as follows:—

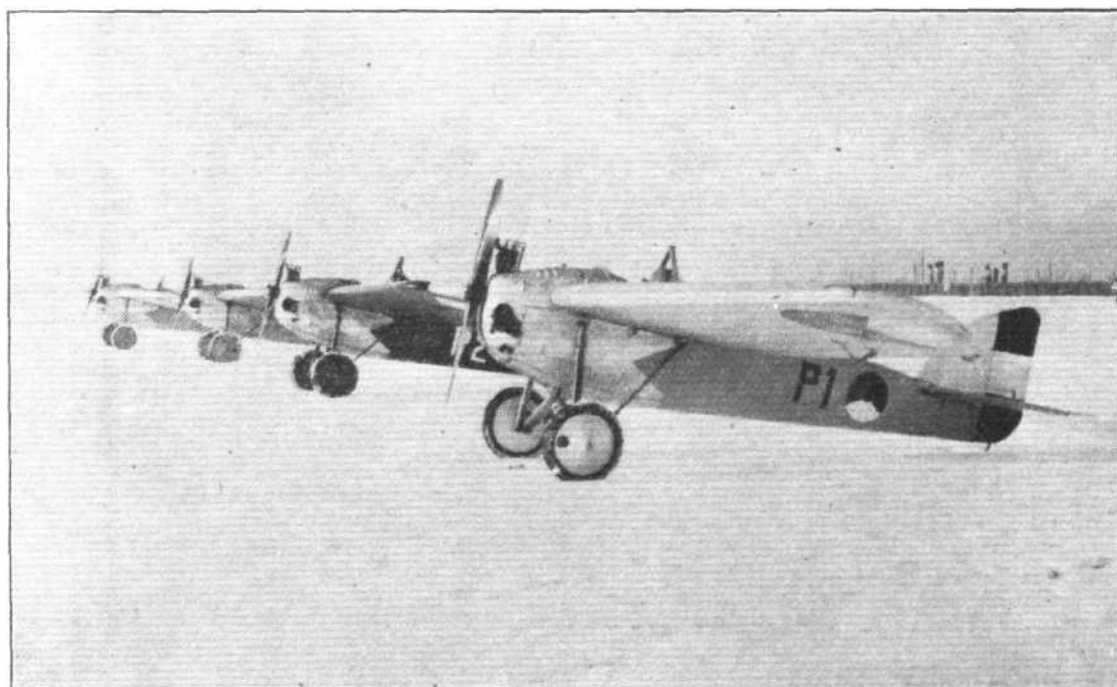
	Jan.	Feb.	Mar.	April.	May.	June.
Scheduled flights	11	35	36	53	56	74
Kms. flown	8,104	23,205	29,092	42,276	38,466	51,674
Number of passengers	27	89	117	175	150	202
Goods (Kgs)	348.5	821.6	982.5	1447.5	1914.6	—

(NOTE.—This table only includes scheduled flights and paying passengers, and not special flights or joy rides.)

In 1926 the Dobrolet proposes to organise additional air lines to Eastern Siberia between the Aldan gold fields and the Amur railway and between Irkutsk and Yakutsk along the river Lena to the Bodaibinsk gold fields. The Dobrolet has already dispatched an expedition to draw up plans for the first line. At present communications between the Amur railway and the Aldan gold fields take 35 days and all freight has to be carried in packs along forest paths, at a cost of about 25 rbls. per 36 lbs. By the air service this distance (600 kms.) could be covered in 5 hours and the cost would be reduced to 25 rbls.

Light 'planes for

East India: A batch of Pander light monoplanes built for Dutch East Indies. Note the tubular cabane added over the cockpit to protect the pilot's head in a crash.



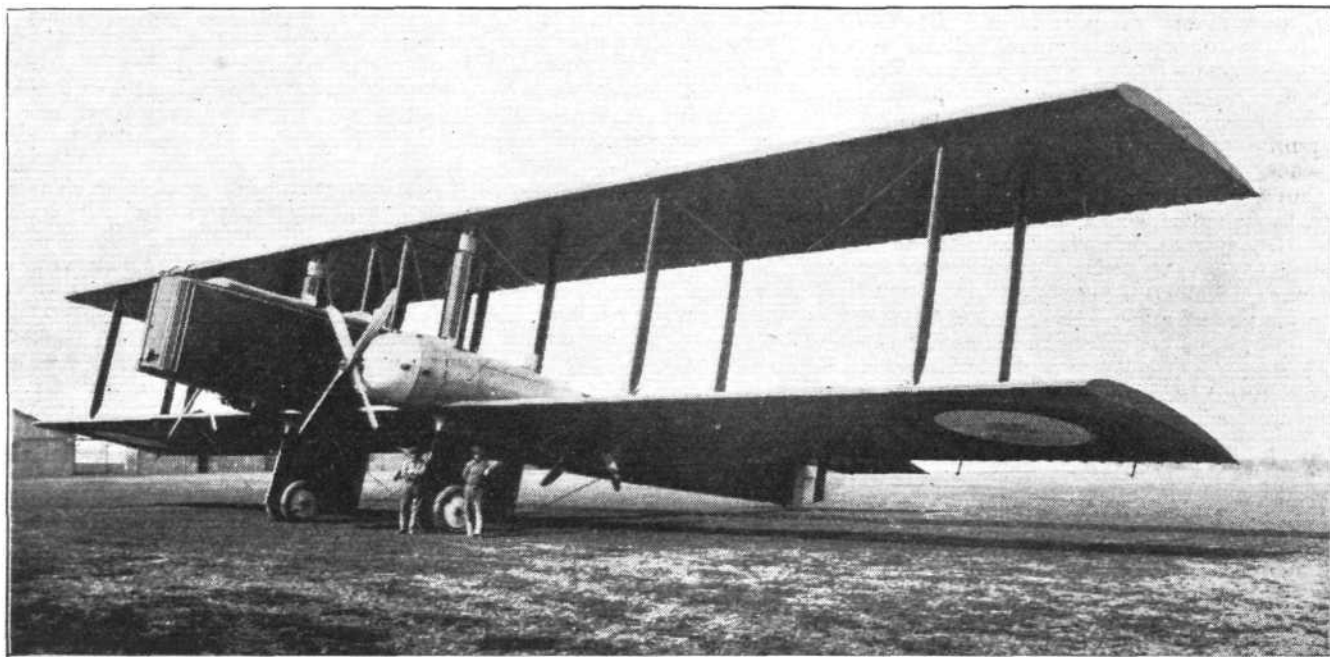
THE FOUR-ENGINED FARMAN "GOLIATH"

Holder of Several French and World's Records

THE accompanying photograph shows the Farman four-engined biplane which recently established several new records for load carried. The machine is in effect a super-Goliath,

the four engines stopped, and with less than full load it will fly level on two engines.

Another photograph shows one of the 500 h.p. Farman

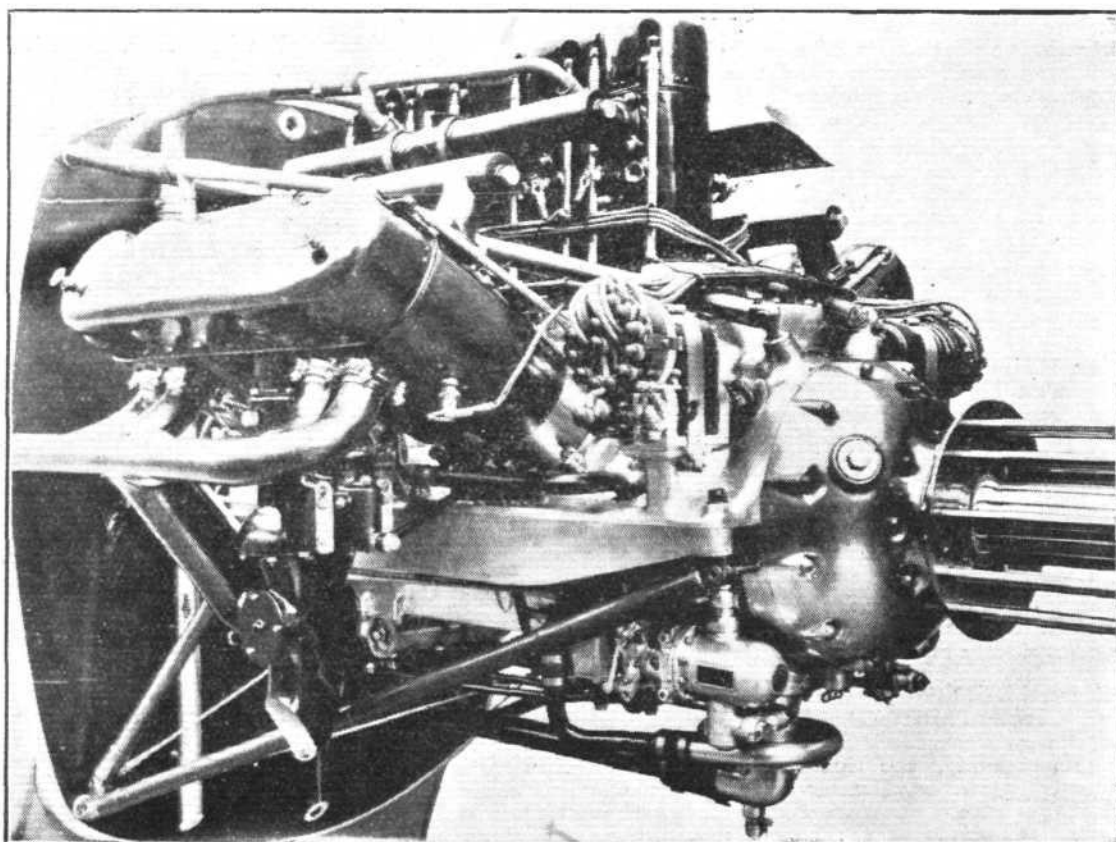


A RECORD BREAKER: The four-engined Farman "Goliath" which has recently established a number of French records and world's records for heavy useful loads. The machine has a span of 35 m. (115 ft.) and a wing area of 266 sq m. (2,806 sq. ft.). The engines (four) are Farman "broad-arrow" types of 500 h.p. each. The weight of the machine empty is 7,150 kgs. (15,750 lbs.), and the normal useful load is 4,500 kgs. (10,000 lbs.), giving normally a total loaded weight of 11,650 kgs. (25,750 lbs.). It is stated that the machine has a top speed of 190 km./h. (118 m.p.h.) at ground level. The ceiling, with a useful load of 4,000 kgs., is 5,000 m. (16,400 ft.), and with a useful load of 6,000 kgs. it is 3,500 m. With one engine stopped the ceiling is stated to be 3,800 m. (12,500 ft.).

with four 500 h.p. Farman engines in place of the two lower-powered engines fitted on the standard "Goliath." It is claimed that by loading the machine to the maximum of its capacity the useful load carried, whether in the form of bombs or as passengers or goods, is in the neighbourhood of 6,000 kgs. (13,200 lbs.). Moreover, the machine is said to be capable of not only flying level but of climbing with one of

engines as installed in this machine. This engine is of the 12-cylinder "broad arrow" type, with a bore of 130 mm. and a stroke of 160 mm. The weight of the engine is 510 kgs. (1,122 lbs.), including two-to-one propeller reduction gearing, propeller hub and electrical equipment, but exclusive of water. It was with a similar engine that a single-engined Farman remained aloft for 45 hours 12 mins.

The Farman engine: This photograph shows one of the 500 h.p. Farman engines installed in the four-engined Farman "Goliath," which has established a number of records for weight-carrying.



SIR SAMUEL HOARE ON AIR MINISTRY ECONOMIES

SIR SAMUEL HOARE, Secretary of State for Air, addressed a largely-attended meeting of the Women's Auxiliary Branch of the Chelsea Conservative and Unionist Association, at the Chelsea Town Hall, on December 16.

Sir Samuel said: we were in the fortunate position of being able to consider our expenditure upon defence in a calm atmosphere. The signing of the Treaty of Locarno had, in the minds of many people, changed the whole course of European politics, and turned the thoughts of Governments from the threatenings of war to the pursuits of peace. These were early days to say how completely the hopes of Locarno would be realised. It was not too early to say that the sky was much clearer, and that the rays of peace were becoming warmer and brighter. In these conditions it was wise and necessary for every country to consider carefully the large sums of money that were being spent upon armaments. Ever since he returned to office he had been, with his advisers, reviewing the position so far as it affected the Air Force and Air Defence. The problem had been by no means easy. On the one hand, there was the undeniable fact that, judged by the standards of all the other great Powers, our air defence had been from the point of view of quantity most inadequate. Although the introduction of air power had made this country liable to the most terrible form of attack, our Air Force, when he first took office in an inferiority of one to ten, was still in an inferiority of one to three as compared with the nearest air force upon the Continent. It would be remembered that it was to remedy our great inferiority in this respect that two and a half years ago we initiated our programme for building up a force for home defence, and that since that time we had been, stage by stage, strengthening our air defences to this end. During the last few months we had once again considered the position in the light, firstly, of the peaceful atmosphere generated by the Treaty of Locarno, and, secondly, of the need for financial economy. After the most careful investigation we had come to the conclusion that however urgent may be the need for reducing expenditure, we must take no dangerous risks with the vital defences of the country, and that therefore the programme of expansion must, as things were, remain intact. We should, therefore, continue to complete stage, by stage, our Home Defence Force of 52 squadrons. Whilst, however, our programme remained intact, his advisers and he have been able to find in various directions opportunities for saving money and postponing

heavy expenditure. In the normal course of things the Air Estimates would rise next year by some 30 per cent, as an automatic result of the policy of expansion that had been approved by successive Governments and sanctioned by the House of Commons. This heavy rise, which would have brought the Air Estimates to a sum well over twenty millions as compared with the sixteen millions of this year, would have been most unfortunate at a time when the whole world was thinking of peace and when every British taxpayer was clamouring for a reduction of Government expenditure. The rise would have in no way been due to Air Ministry extravagance. Inquiry after inquiry had come to the same conclusion that the Air Ministry had carried out its difficult task economically and efficiently. It would have been due to the sole fact that you cannot treble the strength of one of the fighting services without incurring cost, and that next year would have been a peak year in our expenditure owing to the capital expenditure for new stations being incomplete and the maintenance expenditure for half the new squadrons being already started. He was giving away no secrets when he said that he had been able to recommend to the Government a postponement of certain items of expenditure that would avoid anything like this rise. He believed that he was justified in making these economies and in postponing this expenditure owing to the changed situation in Europe. He must none the less emphasise the fact that our air policy and our expenditure upon air defence must always be governed by the conditions in other countries, and that any postponement of our programme must depend on the attitude of other Governments. No great country could run risks with its defence even in a period of peace. Certainly the British Empire and Great Britain could not run such risks. But, as things were, we were prepared, as we always had been prepared, to show in a practical way the sincerity of our belief in the need for restriction of expenditure upon armaments. Although our inferiority in air force as compared with that of other Powers was still notorious, and although air attack was the most dangerous form of attack to which these shores were liable, as a result of the Treaty of Locarno we were prepared to spread to some extent our programme of air defence. Let other countries follow our example, and make it possible for us to carry out this postponement, and for all Governments to avoid in the years to come a race of armaments that would be far more disastrous than any that we had endured in the past.



Air Surveying in North Borneo.

MR. R. C. KEMP, the Managing Director of the Air Survey Co., Ltd.—who, it will be remembered, organised and carried out the aerial survey of the Irrawaddy Delta and other survey work in Burma, etc.—is now completing the contract for the aerial survey of a large area of property belonging to the Anglo-Saxon Petroleum Co., Ltd., in North Borneo. Negotiations are also in progress for other contracts in the East and elsewhere. Mr. F. P. Raynham and Capt. Gaskell are pilots for this company, which has recently secured the services of Capt. J. Durward, who was the chief photographer in the Irrawaddy survey.

Air Mails at Christmas

THE Postmaster General announces that there will be no despatches of letters or parcels to the Continent by air on Christmas Day and Boxing Day.

R.A.F. Flying Accident

THE Air Ministry regrets to announce that as a result of a collision in the air at Manston, near Ramsgate, Kent, between two Avro machines of No. 9 Squadron, Manston, on December 16, No. 345286 L.A.C. Edward Emanuel Dunn, the pilot of one of the machines, was killed, and No. 342140 L.A.C. William Edward Parrish, the pilot of the other machine, was seriously injured.

Colonel Mitchell's Court-Martial

COLONEL MITCHELL'S trial by court-martial for criticism of the administration of the U.S. Army and Navy Air Services has concluded, the Court finding him guilty of conduct prejudicial to good order and military discipline, insubordination, and utterances contemptuous of the U.S. War and Navy Departments. Colonel Mitchell has, in consequence, been suspended for a period of five years, his war record having

been taken into consideration by the Court in pronouncing sentence.

Joy Rides as Prizes

THE Air Ministry will have a stand at the Schoolboys' Exhibition, which opens at the Royal Horticultural Hall, Westminster, from January 2 to 8 next, and will have on view a number of models. They will also offer trips in aeroplanes to youths as prizes for essays on the best methods of advancing civil aviation.

Proposed East African Air Service

MAJOR T. A. GLADSTONE, one of the directors of the Blackburne Aeroplanes and Motor Co., Ltd., addressing a joint meeting of the East and South African sections of the London Chamber of Commerce on December 18, gave a brief outline of the scheme for a proposed air service between Khartoum and Kisumu (East Africa). This service would run once weekly in each direction from Khartoum and Lake Victoria Nyanza, and would later, it was hoped, be extended to Cairo, connecting up with Imperial Airways London-India route. Providing a subsidy was paid, the fare between Khartoum and East Africa would be £60, and in the estimate of the promoters of the scheme, the subsidy required to show a return if half load were carried for one year would be £45,000—£60,000, or £30,000 with full load. We understand the Air Ministry are extremely interested in the scheme.

The Royal Aeronautical Society

THE Ninth Meeting of the Sixty-first Session of the Society, will be held at 7, Albemarle Street, W., on January 7, 1926, at 6.30 p.m., when Prof. A. J. Sutton Pippard, Fellow, will read a paper on "The Experimental Stress Analysis of Frameworks, with Special Reference to the Problems of Airship Design." The chair will be taken by Air Vice-Marshal Sir Sefton Brancker, K.C.B., A.F.C., Fellow.

THE METAL CONSTRUCTION OF AEROPLANES

Its Advantages—Its Present State—Its Future

THE paper under above title, by M. Dewoitine, the famous French aircraft designer, which was read before the Institution of Aeronautical Engineers on December 15, proved one of the most interesting ever read before that society, and the meeting was unusually well attended. Lieut.-Col. J. T. C. Moore-Brabazon was in the chair, but as his presence was urgently required elsewhere, he had to leave the meeting after reading a telegram from M. Dewoitine, in which the author of the paper expressed his regrets at being unable to be present to read his paper in person, being absent on urgent business in Italy.

M. Dewoitine's paper had been translated into English, and the English translation was printed side by side with the original French text. It was decided, as a number of French and Belgian visitors were present, to read first one column of the French text and then a column of the English text. Col. Belaiew had very kindly agreed to undertake the reading of the French text, while Mr. Howard Flanders read the English. The chairman then handed the chair over to Col. Belaiew, and the reading of the paper commenced.

M. Dewoitine's paper commenced with an outline of the reasons which had led French designers to develop metal construction, and particularly duralumin construction. There was little prospect of any marked improvement in the aerodynamic characteristics of wing sections, and as regards thick sections, their chief interest lay in the fact that they offered better prospects for cantilever construction, or at any rate for the reduction of external bracing to a minimum. In the power unit there was also, according to the author, little chance of any appreciable saving in weight, and it therefore seemed that the aircraft designer, if he wished to effect the necessary saving in weight, would have to turn his attention to the structure of the aeroplane. No safe progress could be made by lowering the factors of safety, and M. Dewoitine stated that his machine, the D.1 C.1, had withstood on sand-loading test a load corresponding to 16 without permanent deflection of the wings.

Fundamental considerations of the characteristics of wood and metal would lead one to expect that metal might offer a gain in strength/weight ratio, but in practice other considerations did not always allow of realizing the full strength of metal. The heterogeneous nature of composite machines, incorporating fabric covering, wood members, wire bracing, etc., precluded the idea of a uniform modulus of elasticity for the whole aeroplane and compelled the designer to use high factors of safety.

•With metal the greater part of these disadvantages disappeared. Metal had constant mechanical characteristics, storage presented no difficulties, and personally the author was of the opinion that repairs were often easier in metal than in wood. From the point of view of quantity production, metal construction offered better possibilities for interchangeability.

Turning to the disadvantages of metal construction, M. Dewoitine's paper stated that as construction could not be commenced until the smallest detail had been laid out on paper, a large and competent drawing office was essential, and before even the prototype could be built it was necessary to develop special tools and jigs, so that a metal prototype was more costly than a wooden one. For the production of a number of machines this initial cost was spread over a number of machines, and by making use of drop forging, stamping, spinning, and shearing, the cost was further reduced, while the number of highly skilled workers was reduced. Once the original spade work had been done metal construction would be no more costly than wood construction. M. Dewoitine, and the managing director of the S.E.C.M. firm, M. Amiot, reckoned that although the initial outlay on special machine tools would probably be in the neighbourhood of 1,500,000 francs, this amount would be regained after the production of 100 machines.

As regards the choice of metals, only high-grade steel and aluminium alloys could come into consideration. The former only if a working load of 90 kgs. was permitted. This meant the use of special steels which would have to be heat treated, and this treatment became impossible as soon as certain dimensions were exceeded. Reference was made in the paper to the fine work done in England by Boulton and Pauls, but the author stated that in France it would be very costly, and that in any case France had neither the steels required nor the technicians with the special skill to undertake the

work. Also, in calculating a structure, one would not know the limits of sections, heads of rivets and other metal parts which were not stressed, but the weight of which considerably increased the weight of construction. For small aeroplanes the author considered steel too heavy, and stated that in no *avion de chasse* had the complete construction been in steel. For large machines the disadvantage would diminish, but certain difficulties would remain. Also when looking to the future and contemplating the logical outcome of present studies, the use of metal covering taking its share in the stresses, steel was precluded on account of its weight.

Light aluminium alloys, owing to their low density, permitted of using sufficient thickness to avoid secondary failures, and the use of metal covering became possible. By way of an example the author mentioned the Bernard low-wing cantilever single-seater fighter monoplane exhibited at a Paris Aero Show, in which the wing weight, metal covering included, was 10.5 kgs./sq.m. (2.15 lbs/sq. ft.), and which had supported a load of 18 times its weight on static test. The Dewoitine D.1C.1 weighed 8 kgs/sq.m. (1.63 lbs/sq. ft.) and showed a factor of 16 on static test. Thus on even small machines duralumin covering was possible, while on large machines it became very interesting indeed. Many constructors hesitated to use duralumin because of the need for heat treatment after each factory operation. This should not be exaggerated, and many operations could be carried out with the metal in its cold state. Thus the all-metal Schneider exhibited at the last Paris Show was made entirely by cold working. In the Dewoitine machines members were so designed as to allow of using the metal as delivered from the makers, and only worked parts needed heat treatment.

Finally it was pointed out that while there was in France a great scarcity of aircraft timbers, there was an abundance of aluminium, so that there was material incentive to French constructors to use duralumin.

In the Dewoitine machines built-up wing spars were used, formed by two webs of sheet duralumin, 1.5 mm. thick, of varying depth, joined by angle-sections to sheet metal flanges of several thicknesses, according to local loads, and the thickness of which at the strut attachments was four laminations of 1 mm. each and one lamination of 1.5 mm. on the upper flange, and five laminations of 1 mm. each on the bottom flange. This spar weighed 17 kgs. and had withstood a load of approximately 4,500 kgs. This corresponded to a maximum bending moment at the strut of 3,000 kilogram-metres. A wooden spar of the same overall dimensions would not have withstood this load, and would be heavier than the duralumin spar. For ribs duralumin was equally advantageous whether used in the form of tubes or in the form of U-sections. The French *Section Technique* had developed an empirical formula for least weight of wood ribs per sq. m. wing area, and according to that formula the ribs of the Dewoitine would weigh 1 kg. per sq.m. As constructed in duralumin they weighed 0.75 kg. only. In larger machines the advantage would be more marked since an increase in chord would not be accompanied by a corresponding increase in the size of the tubes from which the ribs were built. In the Dewoitine D.1C.1 the wing weight, without covering, but including struts, was 140 kgs. for an area of 20 sq. m., and the wing had stood a load of 20 tons on sand test. In the Nieuport 29 the wing weight was 190 kgs. for an area of 26.5 sq. m., and this wing cellule had withstood a load of 10 tons only.

Turning to the construction of metal fuselages the author gave a table demonstrating the superiority of round tubes for longerons, but certain difficulties arose in joining the struts to them. Mention was made of the Breguet forged duralumin joint, which had been standardised to such an extent that but two different joints were required in a fuselage. M. Dewoitine, however, still preferred the S.E.C.M. joint, which is in the form of sheet duralumin wrapped around the longerons and jointed by rivets. This was very light and also economic in quantity production.

Metal aeroplanes of the future would not, according to the author, be designed on present lines but it would be necessary to modify our present ideas of frameworks. Thus it was evident that we should not be able to retain the classic arrangement of two wing spars, with ribs supporting the covering. In the same way, a girder type of fuselage did not lend itself to a construction in which the skin or covering took its share of the load. M. Dewoitine stated that he had

specially worked on the metal *cocque* fuselage and had obtained some interesting results. The fuselage of the D.1C.1, with a covering 0.5 mm. thick, and with formers and stringers suitably disposed, weighed 80 kgs., including engine mounting.

In the case of wing construction the difficulties were much greater, owing to the much larger compressive loads. Although the author considered the Junkers type of tubular multi-spar wing construction satisfactory, he thought the use of joints of the S.E.C.M. type for attaching the crinkled strips of the internal trellis bracing to the tubular spars would greatly facilitate manufacture.

In conclusion the author stated that the suspicion with which duralumin had hitherto been regarded in England was not justified, and that he thought those of our constructors who had commenced to use duralumin would very soon become convinced that this was so.

The Discussion

Col. Belaiew then opened the discussion, and called upon Lieut. de Vaisseau, Jacques Bos, Air Attaché of the French Embassy in London, to say a few words. Speaking in French, Lieut. Bos said he was sure they all regretted the absence of M. Dewoitine, who was very sorry he could not be present. He was not, himself, a technician, but he had had sufficient experience of aviation on the service side to realise how much they owed to the work of technicians, and he thought an interchange of ideas such as that provided by the reading of M. Dewoitine's paper before a British society would do a great deal of good.

M. Gaston Montfort, President of the French Chamber of Commerce in London, also speaking in French, said they had not reached their present position of metal construction without troubles, and he referred to the material known as Alferium, a light aluminium alloy employed by the Schneider firm in their monoplane, and said that this had given some trouble at first, but these had now been overcome and the metal was now considered satisfactory.

Major Nerinx, Military Attaché to the Belgian Embassy in London, said he had looked forward to hearing a paper read in French in London. He expressed regrets that the Belgian Air Attaché, the Chevalier Willy Coppens, could not be present, but he was at present in residence in Paris. (Willy Coppens is now Belgian Air Attaché to both London and Paris.—ED.)

Major Davidson, American Military Attaché, said he did not feel competent to enter into a technical discussion. He was interested in the French factors of safety of 16. In America they used a factor of 15, and they had been somewhat scared when, on stunt flights with machines equipped with accelerometers, it was found that figures as high as 7g were reached in certain manoeuvres.

Mr. J. D. North, Chief Engineer and Designer of Boulton and Paul's, said he was interested to observe in how many cases the experience of M. Dewoitine tallied with that of Boulton and Paul. He would draw special attention to the paragraph commencing: "Enfin la creation du prototype dependra," and the importance of technique. They had been addressing themselves to systematisation, and he did not find the figure of 1½ million francs excessive for tooling up. He gathered that this figure referred to special tools rather than to machine tools, as stated in the translation of the paper. He recalled that in England during the first few years of development work the use of duralumin for structural members was rigorously prohibited by the Air Ministry, and that in this country we were thus obliged to solve all our problems in steel, even those problems to which steel was least adapted. It was true that the British machines were day bombers of approximately 4,000 kgs. weight, but he could not agree that the problem was easier than with the fighter class. On the contrary, these twin-engined machines, with their extensive and complicated equipment, offered, he believed, more difficult problems than the fighter. Incidentally, M. Dewoitine was in error in imagining that the fighter had not been produced in steel. The Siddeley "Siskin" of the R.A.F. was all steel.

The specific properties of steel compared favourably with duralumin. The effective compression strength of steel was realised as a minimum at 65 tons/sq. in. (about 100 kgs./sq. mm.), while that of duralumin was, according to their experience, 15 tons/sq. in. (23 kgs./sq. mm.), which was equal to a steel only just over 40 tons/sq. in. (about 60 kgs./sq. mm.) in effective compression strength. It was true that occasionally higher figures were realised in duralumin, but similarly higher figures were obtained in steel, *e.g.*, up to 80 tons/sq. in. (125 kgs./sq. mm.). The specific elasticity of the two materials was substantially the same. Duralumin was particularly susceptible to failure by reverse bending. Practically all

fatigue fractures in duralumin which he had seen had been due to reverse bending being set up by vibration of the structure.

Steel spars suitable for biplane structure were, in his experience, in most cases lighter than duralumin, since they got the full benefit of the greater specific strength. These spars were quickly and economically made, though the technique of their design and manufacture was complicated. M. Dewoitine would, he thought, be surprised to know that they hardened and tempered these spar sections after forming in lengths up to 75 ft., producing parts thereby of interchangeable accuracy, *i.e.*, within a few thousandths of an inch. He would also add that they obtained a shear stress of over 30 tons per square inch in their rivets, which were of alloy steel, and that the weight of rivets in steel parts compared quite well with duralumin parts. It was perhaps not necessary to state that the design and material of these rivets had been carefully studied and they were specially made.

Although they preferred to use steel for the primary structure (*e.g.*, the spars, fuselage longerons, interplane struts, engine mountings, &c.) it was their regular practice to use duralumin for the secondary structure (ribs, leading and trailing edges, &c.). This combination gave, he believed, the most economical results from all standpoints.

The difference in the value of E of the two materials, was easily taken into account in stressing, and there were many more serious difficulties in stressing than that, particularly in the multiply-redundant types of structure, such as multi-spars and skin-wings which the author favoured. M. Dewoitine took his stand with the cantilever-metal-skin school. Mr. North would agree that if this was to be the ultimate aim (and he was far from conceding that it was)—then Duralumin was indicated, as the heavy variations of stress were more easily dealt with in the simpler forms permissible with duralumin. Steel did not lend itself to taper construction, and was, of course, quite impracticable as a covering. He would say one thing, that the figures 2.15 (10.5 kgs.) and 1.64 (8 kgs.) lbs. per square foot, seemed heavy to one accustomed to biplane construction for fighters, and dimensional theory certainly did not indicate reduction of weight with increase of size, but the contrary.

As the ordinary biplane type of construction was particularly adaptable for steel spars, Mr. North was always anxious that his preference for that type should be sound, because as Mr. Harry Brearly once said, "the danger of research is that we tend to find what we are looking for." He could not help feeling that Dr. Rohrbach's advocacy of heavy loading for large seaplanes was unconsciously due to the fact that without heavy loading his system of construction would be impossible.

He very much appreciated M. Dewoitine's paper, and thanked him for giving us the benefit of his experience. The two curses of aviation to-day were too much secrecy and too little flying. Before the war, there was a very free interchange of ideas among those engaged in all branches of aeronautical work, and he wished there was more of the same spirit today.

Captain W. H. Sayers called attention to one very important factor in connection with metal aircraft construction. In the next war there would certainly not be enough spruce for the needs of a country with a large Air Force. This point had been mentioned, but perhaps not stressed as much as it deserved, by the author of the paper. Whether Europe liked it or not, it would have, for this reason, to turn to all-metal construction. He pointed out that France, with her large supplies of aluminium, had naturally developed duralumin construction. In this country, we had the high-grade steels necessary, and had developed steel construction. In Germany, they used both to some extent. In the United States, where they owned almost all the world's aircraft timber supply, it was interesting to note that relatively little metal construction had been carried out.

Mr. J. S. L. Oswald, of the English Electric Co., referred to a new British flying-boat with metal hull, which had recently been successfully tested. This machine had come out about the same weight as the wood machine, and he thought there could be no doubt that when the constructors had had more experience, they would be able to produce one for considerably lighter weight than the wood machine. Duralumin construction had several advantages. The number of man-hours was reduced, which was of importance, and the absence of water soakage was avoided.

Mr. C. V. Coates, M.A., of Birkbeck College, recalled his war-time experience at the Air Ministry. He was then a believer in metal construction and had pointed out that metal construction would pay if they could get an alloy with a strength of 14 tons per square inch.

THE ROYAL AIR FORCE

London Gazette, December 15, 1925

General Duties Branch

Flight Cadet R. E. Costa, having successfully passed through the R.A.F. Cadet College, is granted a permanent commn. as a Pilot Officer, with effect from and with seny. of Oct. 29. Lieut. J. F. Fosbroke Pain, 1st King's Dragoon Guards, is granted a temp. commn. as a Flying Officer on seconding for four years' duty with the R.A.F.; Nov. 28 (substituted for *Gazette*, Dec. 8). The following Pilot Officers are promoted to rank of Flying Officer:—A. F. Hutton, G. W. P. Irwin; Aug. 14. G. W. R. Russell; Sept. 14. J. C. Marcy, D. Robinson (Sec. Lieut., Glos. Regt., T.A.); Oct. 14. V. B. Bingham-Hall, M.C. (Capt., Glos. Regt., T.A.); A. W. B. McDonald; Oct. 15. A. N. Francombe, H. E. N. Burton, C. S. Staniland, V. G. H. Gee, R. A. Ford; Nov. 15. R. R. Bennett; Nov. 21.

Pilot Officer on probation E. G. D. Stewart, M.C., is confirmed in rank; Nov. 7. Flying Officer L. Hamilton, M.B.E., D.F.C., is restored to full pay from half-pay; Sept. 15 (since resigned). Flying Officer C. H. Whitlock is placed on retired list at his own request; Dec. 16. The following Flying Officers are transferred to the Reserve:—Class A.—L. Whitfield; Dec. 16. Class C.—S. G. Williams; Dec. 9.

Pilot Officer D. W. Trotter resigns his short service commn.; Dec. 16. Flying Officer J. L. Hayward (Lieut., R.A.) relinquishes his temporary commn. on return to the Army; Nov. 28. The short service commn. of Pilot Officer on probation F. O. W. Stokes is terminated on cessation of duty; Nov. 11.

Accountant Branch

The following are granted permanent commns. as Pilot Officers on probation, with effect from, and with seny. of, Dec. 7:—D. C. Stone, C. L. Dook, H. R. Withers, A. E. Fairs, M.C. (Lieut. and Qmr., R.A.M.C., T.A.), J. P. Cave, D. Sender, J. A. Stephenson, A. Ll. Derry, K. A. Jackman, W. F.

Quilliam, J. Lambie (Capt. Indian Army, retd.), H. Crowther, R. Cassels. Pilot Officer on probation R. C. Dickinson is confirmed in rank and promoted to rank of Flying Officer, with effect from Dec. 3, and with seny. of Nov. 10, 1925.

Medical Branch

The following are granted short service commns. as Flying Officers for three years on the active list, with effect from, and with seny. of, Dec. 1:—E. A. Aslett, H. M. Levy.

Reserve of Air Force Officers

The following are granted commns. on probation in Class A, General Duties Branch, in the ranks stated (Dec. 15):—Flying Officer D. Davidson. Pilot Officer S. L. F. St. Barbe.

A. F. Waghorn is granted a commn. in Class AA, General Duties Branch, as a Pilot Officer on probation; Nov. 30. The following Pilot Officers are promoted to rank of Flying Officer:—R. W. Jones; July 9. H. Jones; Sept. 11. J. J. Hickman; Sept. 18. L. D. P. Joseph; Sept. 18. W. G. Robinson; Sept. 20. J. W. Brown; Sept. 20. H. D. Morley; Sept. 21. M. C. Kerr; Sept. 24. J. M. Mathieson; Sept. 25. R. A. Whitehead; Sept. 26. A. J. Stubbings; Oct. 1. R. A. Jacquot; Oct. 1. K. C. Whitwell; Oct. 13. S. Barker; Nov. 5. F. James; Nov. 5. M. H. Edmunds; Nov. 5. J. Paterson; Nov. 9. J. H. Taylor; Nov. 15. P. H. Davies; Nov. 25. A. M. Mackay; Dec. 3.

Flying Officer A. J. R. Adam is confirmed in rank; Oct. 2. The following Flying Officers are transferred from Class A to Class C:—E. V. H. Jarvis; Oct. 8. W. McL. Hiron; Nov. 6. Flying Officer F. Ll. Hudson is transferred from Class C to Class A; Dec. 6. The commission of Pilot Officer on probation W. J. Youldon is terminated on cessation of duty; Nov. 3.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander E. W. Norton, D.S.C., to No. 70 Sqdn. Iraq to command. 1.12.25.

Squadron Leader J. M. Robb, D.F.C., to R.A.F. Depot, on transfer to Home Estabt. 20.11.25.

Flight Lieutenants: D. W. Clappen, to H.Q. Spec. Res. and Auxiliary Air Force. 10.12.25. D. W. King, to H.Q. Coastal Area. 10.12.25. H. E. Forrow, to H.Q., India. 8.11.25. W. M. Fry, M.C., to Station H.Q., Bircham Newton. 4.12.25.

Flying Officers: P. J. Bett and A. H. Wheeler, to No. 2 Sqdn., Manston. 15.12.25. A. R. Hamilton, J. H. Powle and C. H. Tighe, to No. 13 Sqdn., Andover. 15.12.25. G. Combe, to R.A.F. Depot, on transfer to Home Estabt. 11.11.25. R. H. Bibby, to Central Flying Schl., Upavon. 1.12.25.

Pilot Officers: R. D. Adams, E. Addis and C. A. Bell, to No. 16 Sqdn., Old Sarum. 15.12.25. R. L. Burnett, to No. 2 Squadron, Manston. 15.12.25. J. G. Chamberlain and D. C. Shaw, to R.A.F. Base, Calshot. 15.12.25. S. A. V. Evans and L. F. T. Price, to No. 56 Sqdn., Biggin Hill. 15.12.25. D. S. Green, to No. 43 Sqdn., Henlow. 15.12.25. A. J. Holmes, N. K.

Howard and C. P. Vines, to No. 4 Sqdn., S. Farnborough. 15.12.25. J. C. Noel, to No. 29 Sqdn., Duxford. 15.12.25. J. H. C. Purvis and L. A. Walsh, to No. 25 Sqdn., Hawkinge. 15.12.25.

Medical Branch

Wing Commander W. W. Shorten, F.R.C.S. (E.), to R.A.F. Hospital, Halton, 7.1.26.

Squadron Leaders: B. F. Beatson, D.T.M., to Inland Area Aircraft Depot, Henlow. 8.12.25. T. C. St. C. Morton, M.D., D.T.M., and H., to R.A.F. Hospital, Halton. 12.12.25.

Flight Lieutenants (Dental): H. H. Mallett, to No. 5 Flying Training Sch. Sealand. 17.12.25. A. Williams, to R.A.F. Depot, on transfer to Home Estabt. 15.10.25.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on December 17: Lieutenants (Flying Officers, R.A.F.).—R. H. Langton, to *Eagle*, for No. 402 Flight (Dec. 5); J. N. Sparks, to *Eagle*, for No. 440 Flight (Dec. 12); and E. W. E. Lane, to *Furious*, for No. 420 Flight (Dec. 15).

IN PARLIAMENT

Iraq Defence Forces

SIR F. SYKES asked the Prime Minister, on December 15, whether the Committee of Imperial Defence are satisfied with the efficiency of the system under which land and air forces are strategically employed in defence in Iraq under a single administration?

The Prime Minister: The answer is in the affirmative.

R.A.F. and Parachutes

COLONEL DAY, on December 16, asked the Secretary of State for Air when it may be expected to receive delivery of the American manufactured parachutes for the use of flying officers and men of the Royal Air Force?

Sir Samuel Hoare: Deliveries began in July last and have been made weekly during the past three months.

Imperial Airways, Ltd.

REAR-ADMIRAL SUETER asked the Secretary of State for Air whether he is satisfied that the present agreement with Imperial Airways, Ltd., is functioning satisfactorily, and is such as to ensure the development of British civil air transport on a sound basis?

Sir S. Hoare: I am advised, on the basis of recent experience, that the sound line of development for regular air transport lines is in the direction of large high-powered machines, which can be run more economically and efficiently than a larger number of small machines of equivalent capacity. The Air Ministry found that the stipulation in its existing agreement with Imperial Airways, Ltd., requiring the completion of a given mileage in order to qualify for the full subsidy, was threatening to discourage development on the lines described, as a simple mileage requirement puts a premium on the use of small machines. I have accordingly arranged recently with Imperial Airways to convert the mileage requirement of 1,000,000 miles per annum into a composite requirement, which is regarded as a fair equivalent, of 425,000,000 h.p.-miles per annum; this will allow the mileage of high-powered machines to count more heavily than that of low-powered machines, and will thus encourage the company to develop towards a self-supporting basis as the subsidy decreases. The amount of the subsidy and the general provisions of the original agreement remain unaltered. A supplemental agreement, modifying the terms of the original agreement as above, is being prepared, and when the necessary document is executed I will lay it as a White Paper with an explanatory statement.

Air Service, Egypt and India

REAR-ADMIRAL SUETER asked the Secretary of State for Air whether he is yet in a position to make any further statement on the project for an aeroplane service between Egypt and India.

Sir S. Hoare: Negotiations with Imperial Airways, Ltd., for a regular air service between Egypt and India had advanced sufficiently last August for a detailed survey of the route to be carried out in September by officials of the company and Air Ministry, and after consideration of the results of this survey definite heads of agreement for this service have been signed.

The most important new point emphasised by the survey was the great advantage which would result from the use of three-engined machines, which should make forced landings very improbable—a matter of prime importance on this unfrequented route. This, however, involves an increase of cost per

machine, and, owing to the limitation of the money available, a consequent reduction in the number of machines and frequency of the services as compared with the project outlined to the House last July.

The agreement accordingly makes provision for a subsidy which can be earned by the company on the basis of a regular fortnightly service with three-engined machines for mails, goods and passengers, in each direction between Egypt and India via Baghdad and Basra.

This subsidy will, I hope, enable the company eventually to increase the frequency of its service to a weekly basis as traffic expands and as increasing income from that and other sources becomes available.

The maximum annual subsidy, to be earned by a stipulated degree of regularity in completed flights on each half of the route, will be £93,600. The duration of the agreement is to be for five years.

The three-engined machines will take some time to construct, and I do not expect the service to be in actual operation much before the end of next calendar year. The Air Ministry will, in the meanwhile, proceed with the items of ground organisation for which it is responsible.

As soon as the agreement is executed in legal form I propose to lay it as a White Paper, with an explanatory statement.

Lieut.-Commander Kenworthy: Does the right hon. gentleman propose to extend this service to Australia?

Sir S. Hoare: We shall have to see how the first stage works.

Airships and Dual Control

Mr. GRANT asked the Secretary of State for Air if he will consider the advisability of instituting dual control in all airships publicly used for the conveyance of passengers?

Sir S. Hoare: It is the practice to provide means by which rigid airships may be controlled from elsewhere in the event of accident to the normal control post, and a certificate of airworthiness would not be granted if this requirement were not satisfied.

Royal Air Force

SIR F. WISE asked the Secretary of State for Air the numbers and the cost of the Air Force and the numbers in Egypt in 1914 and in 1925, respectively?

Sir S. Hoare: The strength of the Royal Naval Air Service and Royal Flying Corps (the Royal Air Force was not, of course, created until 1918) at the outbreak of war in 1914 was 197 officers and 1,647 other ranks; there were then no air forces in Egypt. The strength of the Royal Air Force on December 1, 1925, was 3,382 officers, 103 cadets and 30,566 airmen. The average strength in Egypt during 1925 has been 272 officers and 1,820 airmen. The combined cost of the Royal Naval Air Service and Royal Flying Corps in 1913-14 was stated by the Financial Secretary of the Treasury, in a reply given on April 29 last, to be £1,375,700, of which amount £605,700 was charged to Navy Votes and £770,000 to Army Votes. The gross total of Air Estimates for 1925-26 is £21,319,300. The figure given for 1913-14 is the only one available, but is not, of course, in any way comparable with that for 1925-26, as quite apart from expenditure on civil aviation and the Meteorological Office, Air Estimates today include provision for numerous services which in 1913-14 were not regarded as air expenditure, but as falling naturally under the ordinary heads of Navy and Army Votes.

R.A. Monthly List

CAPTAIN GEE, on December 17, asked the Secretary of State for Air, whether he will arrange that in future publications of the monthly Air Force List the original dates on which officers on the staff of the Royal Air Force at the Air Ministry were gazetted to their appointments should be inserted as is done in the monthly Army List?

Sir S. Hoare: The suggestion contained in my hon. and gallant Friend's question is being carefully considered, and I hope that it will be found possible to adopt it.

Parachutes

SIR F. HALL asked what progress has been made with regard to supplying parachutes for the Royal Air Force; how many parachutes forming the contract of 2,261, of which 1,500 were to be manufactured in America, have now been delivered; and what steps are being taken to expedite the complete equipment with parachutes of all machines belonging to the Royal Air Force?

Sir S. Hoare: In answer to the first and second parts of the question, substantial progress has been made with deliveries and 341 parachutes were despatched by the contractor up to and including November 27. In answer to the last part, as the result of representations by the Air Ministry, arrangements have already been made for expediting very considerably the contract rate of delivery.

Flying Personnel and Insurance Premiums

REAR-ADMIRAL SUTER asked the Secretary of State for Air, whether he is yet in a position to make a further statement on the subject of insurance facilities for flying personnel; and whether his negotiations with the insurance offices have resulted in any lowering of the high rates of premium previously charged for cover against flying risks in time of peace?

Sir S. Hoare: I am glad to be able to state that, thanks to the friendly co-operation of the Life Offices Association, several companies of high standing have already intimated their willingness to quote rates of premium which represent a very substantial reduction on the rates previously quoted. For example, whereas hitherto an officer of the rank of squadron-leader seeking cover against peace-time flying risks has, under the terms offered by many companies, been required to pay an additional premium of as much as five guineas per cent. annually on the sum insured, several companies now offer the same benefits in return for an additional payment of only two guineas per cent. The additional premium payable has thus been reduced by more than half. Further, this reduced additional premium is payable for five years only instead of over the whole period for which cover is desired, and once these five annual payments have been completed, the officer is fully insured against flying risks without any further additional payment whatsoever. I have every hope that other companies will very shortly be prepared also to offer substantially reduced terms. I am taking special steps to bring the greatly improved insurance facilities thus secured to the notice of all serving officers.

Troop-carrying Aircraft

SIR F. SYKES asked whether troop-carrying aircraft have been employed in connection with Army exercises; whether he can make any statement as to the resultant effect on Army mobility; and what arrangements exist for the representation of the views of officers in charge of such operations in the design of troop-carrying aircraft?

Sir L. Worthington-Evans: Troop-carrying aircraft have not been employed in connection with Army exercises. The use of troop-carrying aircraft has been limited to occasions of emergency in Iraq, where small detachments have been transported for considerable distances in this manner. The War Office and Air Ministry are in close touch regarding the results of the experience in Iraq which has been valuable.

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# A Change at "Wakefields"

AFTER 19 years' service with C. C. Wakefield and Co., Ltd., Mr. Frank Fisher, we are informed, has retired. Frank Fisher, during that 19 years, has always been a very familiar figure in the world of aviation, and there was hardly a big aviation event at which he was not as much in evidence as was Wakefield's "Castrol"—the interests of which "Frank" looked after so well. We can only wish Mr. Fisher all happiness for the future, and to Mr. A. Limb, who is taking over the reins of office, we wish every success.

# Imperial Airways: Loss on First Year

THE first report of Imperial Airways, Ltd., just issued, shows a loss of £15,217 after providing for an obsolescence reserve of £22,998, charging £63,553 for ordinary depreciation and maintenance, and crediting subsidies amounting to £139,410. Owing to labour troubles at the start, all services were suspended for one month and only skeleton services flown during the following month. A considerable portion of the remaining ten months, however, is regarded as more or less of an experimental period, as all the services had to be completely reorganised, altered, and modified. The modified Government subsidy will, it is considered, enable the company to develop in a satisfactory way and in accordance with the national needs. Investments and cash at bankers amount to £155,781, equivalent to 4s. 5½d. for every 10s. of paid-up share capital. In addition, heads of agreement have been arranged whereby the company will receive an additional subsidy of £93,600 per annum in consideration of establishing an Eastern service between Egypt and India. The meeting will be held at the Hotel Cecil on December 29, at noon.

# Rolls-Royce Ltd.

THE Directors of Rolls-Royce, Ltd., will shortly issue their annual report. It will show that (subject to audit) the profits for the year ended October 31 last, amounted to £165,000. They have decided to recommend at the annual meeting of shareholders, which is to be held at Derby, on Friday, January 15, 1926, that a dividend of 8 per cent. should be paid in respect of the year named.

# PUBLICATIONS RECEIVED

*With the Prince of Wales in Africa.* Crossley Motors, Ltd. Gorton, Manchester.

*The Official Gazette of the United States Patent Office, November 10, 1925. Vol. 340. No. 2.* United States Patent Office, Washington, D.C., U.S.A.

*Report of the Council for Session 1924-1925.* Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow.

*With Seaplane and Sledge in the Arctic.* By George Binney, Hutchinson and Co., Paternoster Row, London, E.C.4. Price 21s. net.

*The Canadian Patent Office Record. Vol. LIII, No. 44.* November 3, 1925. Canadian Patent Office, Ottawa, Canada. Price 25 cents.

*The Canadian Patent Office Record, November 17, 1925. Vol. LIII, No. 46.* The Canadian Patent Office, Ottawa, Canada. Price 25 cents.

*Regulations Governing the Graduation of Altimeters Consequent upon the Adoption of an International Standard Atmosphere.* Air Publication 1173. First Edition, September, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 1d. net.

*E. T. Busk: A Pioneer in Flight.* By Mary Busk. John Murray, 50A, Albemarle Street, London, W.1. Price 7s. 6d. net.

*The Official Gazette of the United States Patent Office, November 17, 1925. Vol. 340 No. 3.* United States Patent Office, Washington, D.C., U.S.A.

*Rendiconti Tecnici della Direzione Generale del Genio e delle Costruzioni Aeronautiche. Nov. 15, 1925. Vol. XIII No. 8.* Ufficio di Stato Maggiore R. Aeronautica, Rome.

*Caratteristiche Aerodinamiche di Ali, Vol. VIII.* Allegato ai Rendiconti Tecnici del Ministero dell'Aeronautica. Ufficio di Stato Maggiore R. Aeronautica, Rome.

*Rivista Aeronautica, October 1925.* Direzione della Rivista Aeronautica, Via Torino 39, Rome.

*Caratteristiche Aerodinamiche di Ali, Vol. VII.* Allegato al Rendiconti Tecnici del Ministero dell'Aeronautica. Ufficio di Stato Maggiore R. Aeronautica. Direzione della "Rivista Aeronautica," Via Torino 39, Rome.

*Notiziario Tecnico. No. 3-4. September-October, 1925.* Ministero dell'Aeronautica. Direzione della "Rivista Aeronautica," Via Torino 39, Rome. Price L.200.

*Caratteristiche Aerodinamiche di Ali, Vol. VI.* Allegato al Notiziario Tecnico del Ministero dell'Aeronautica. Ufficio di Stato Maggiore R. Aeronautica. Direzione della "Rivista Aeronautica," Via Torino 39, Rome.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1924

Published December 24, 1925

- 20,542. S. A. REED. Air propellers. (243,454.)
20,810. H. ZEIMSS, JUN. Aeroplanes. (243,460.)
23,712. CIE. DES FORGES ET ACIERES DE LA MARINE ET D'HOME COURT. Instruments for determining co-ordinates of an aerial target. (225,185.)
25,790. R. F. H. WILSON. Rotary fluid-pressure engines. (243,500.)

APPLIED FOR IN 1925

Published December 24, 1925

- 14,394. MAYBACH-MOTORENBAU GES. Lubricating systems. (234,854.)

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